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TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1899.

PART I.

BOSTON:
PRINTED FOR THE SOCIETY.
1899.

☞ SEE LAST PAGE OF COVER.

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59,207
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CONTENTS.

PAGE

BUSINESS MEETING, Jan. 7, 1899; President's Address, pp. 5–14; Appropriations for 1899, 14; Appointment of Treasurer and Secretary, 15; Decease of Charles N. Brackett announced, 15; Successor elected, 15; Payment of Premiums for School Gardens, etc., 15; Member added to Committee, 15; Publications and Lectures announced . . . 15

MEETING FOR LECTURE AND DISCUSSION, Jan. 14; Diseases of Plants caused by Fungi, by Prof. William T. Sedgwick 16–20

MEETING FOR LECTURE AND DISCUSSION, Jan. 21; Experimental Work in Field and Garden, by Hon. Aaron Low, pp. 20–28; Discussion . 29–32

MEETING FOR LECTURE AND DISCUSSION, Jan. 28; Peach Culture, by J. H. Hale, pp. 32–36; Discussion 36–38

BUSINESS MEETING, Feb. 4; Treasurer's Report presented, pp. 38, 39; Memorial of Charles N. Brackett, 39; Card List of Awards, 39; Transactions to be illustrated and placed on sale, 39, 40; Two members elected, 40; Appropriation for Garden Committee 40

MEETING FOR LECTURE AND DISCUSSION, Feb. 11; Injurious Insects and their Transformations, by Prof. Clarence M. Weed, pp. 40–54; Discussion 54–56

MEETING FOR LECTURE AND DISCUSSION, Feb. 18; Why Crops must have Nitrogen, by Prof. G. C. Caldwell 56–74

MEETING FOR LECTURE AND DISCUSSION, Feb. 25; Agriculture of Ancient Times, by Hon. William R. Sessions, pp. 75–85; Discussion . . 85, 86

BUSINESS MEETING (SPECIAL), March 4; Purchase of Land and Erection of Building 86–89

MEETING FOR LECTURE AND DISCUSSION; Questions Answered and Unanswered, by Walter F. Taber, pp. 89–97; Discussion 97, 98

MEETING FOR LECTURE AND DISCUSSION, March 11; Market Gardening, by Herbert W. Collingwood, pp. 98–106; Discussion 106, 107

MEETING FOR LECTURE AND DISCUSSION, March 18; Seventieth Anniversary of the Society, p. 108; Horticulture in Japan, by John K. M. L. Farquhar 109–116

MEETING FOR LECTURE AND DISCUSSION, March 25; Roadside Treatment, by Mrs. F. H. Tucker, pp. 116–127; Discussion 127–129

The following lectures have been circulated to some extent in the form of slips reprinted from the reports made by the Secretary of the Society in the "Boston Evening Transcript." As here presented, the lectures are, as far as possible, printed in full, and reports of the discussions following the lectures are added, these, where it appeared necessary, having been carefully revised by the speakers.

The Committee on Lectures and Publication take this opportunity to repeat what they have before stated, that the Society is not to be held responsible for the certainty of the statements, the correctness of the opinions, or the accuracy of the nomenclature, in the lectures and discussions now or heretofore published, all of which must rest on the credit or judgment of the respective writers or speakers, the Society undertaking only to present these papers and discussions, or the substance of them, correctly.

AARON LOW,
J. H. BOWDITCH,
E. W. WOOD,
Committee on Lectures and Publication.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, January 7, 1899.

A stated meeting of the Society was holden today at eleven o'clock, the President in the chair.

This being the commencement of the term of office of the new board of Officers and Standing Committees, the President, FRANCIS H. APPLETON, delivered the usual annual address, as follows:

ADDRESS OF PRESIDENT APPLETON.

Members of the Massachusetts Horticultural Society:

The question again comes before me, What can I say to you that shall sufficiently tell you a story of our more recent work, and which you may not learn through the respective reports of the Secretary and Librarian, Treasurer and Superintendent of Building, and our several Committees — and which story shall tend to promote the chartered objects of this Society?

Permit me first to go back to a period when the matter of promoting better agriculture by organized effort was early planned, after a brief reference to the most systematic organized effort that we have before us, in this nation, at the present time.

At the United States Department of Agriculture, in Washington, we find, under its title, a most complete classification for all the working Bureaus and Divisions, and they doing scientific and practical work, earnestly directed, from the Secretary's (a Cabinet officer) office down, in their aim to do all that seems wise to

advance and protect the many agricultural industries throughout this extensive Nation.

So important a work is that of the Department of Agriculture, with its collections, from a business standpoint, that more substantial fireproof buildings, with greater economic arrangement of the interior than now exists, have from time to time been advised; and such advice should be given most careful thought and planning preparatory to the hoped-for time when Congress shall in due course authorize such improvements as shall be deemed wise.

In said Department horticultural matters have their place in the appropriate Bureaus and Divisions, as we recognize them in our varied work here by Committee designations, and in our Prize Lists, and otherwise.

Shortly before 1790 the men of government and business, General Washington and those who were his near associates, saw that the agricultural interests of the Nation — and the term "agricultural" was used in its broad sense — needed the stimulus of organization to advance the character and quantity of its products in order better to supply the markets of our land.

In New York, Massachusetts, Pennsylvania, and South Carolina, influential men of those States, in their centres of business, organized societies for the promotion of agriculture in its varied forms. The early agricultural societies, with their occasional — or annual — assembling of persons on Market or Fair Day, became promoters of agriculture and trade, composed in their membership of business and professional men of that period, who were closely in touch with the best financial methods and needs, and who had the general welfare of the Nation and State at heart.

At those assemblages, in the interest of agriculture (farming and horticulture, etc.), we have evidence that the participants had a care for the wise conduct of affairs of state, and that the selection of men of high character and well-directed purpose was not lost sight of as a factor in the advancement of the leading charge confided to their care.

They realized that public and private affairs were in the most wholesome condition when public office was administered most wisely.

In our own State a Society for Promoting Agriculture was

established in 1792, and, by its early influence, similar, but more local bodies were soon organized to promote the good work throughout the State, which enlisted the leading men of business in most of our counties. The publication then known as the "New England Farmer" was an early mouthpiece of these efforts, as were also the earliest publications of the parent Society.

Much was there published from the pen of the best informed men of those days to promote better work, more intelligent work; to encourage invention in the line of agricultural implements, or the importation of implements and live stock better adapted to the needs of our people, etc. Market gardening and general horticulture are a natural outgrowth of more intensive farming, and more intensive farming is the profitable type of farming for our New England agriculturist to adopt in his own and the State's interest.

Turning to the founding of this Society, we find, among those who were at the first meeting, men who, as patriot-farmers, had been interested in the establishing of the earliest agricultural societies, with the Hon. John Lowell in the chair. General H. A. S. Dearborn, of Roxbury, of horticultural fame, became first President, and drafted the first constitution; and the State was well represented in our early membership.

This Society first existed as a collection of active members, with little property, and members were sought and needed to give to the Society the living strength that was essential to its chartered objects. The activity and ability of that earnest early membership was then our capital, but money was sought to enhance possibilities in other directions.

Whatever simple prizes were early offered proved a great spur to improved horticulture, and stimulated a largely increased interest in horticulture among our men of wealth, and commercial growers. Without the former, horticulture would have advanced slowly indeed.

The demand for a high quality of products was an important result; and the Boston and Massachusetts markets responded in a manner that has always been a credit and an honor to this State.

Today, with the splendid record of success that this Society has achieved since the 17th of March, 1829, — seventy years, — measured by the results it can claim to have attained in many ways, by

the superb library of publications that has been wisely accumulated for horticultural study, with its unique card catalogue of plates, as well as card catalogue of other contents, and with its real estate on this site, all of which is forever dedicated to the cause of charitable horticultural advancement, as the Act of Incorporation states, — which is "for the purpose of encouraging and improving the science and practice of horticulture, and promoting the amelioration of the various species of trees, fruits, plants, and vegetables, and the introduction of new species and varieties; . . . to receive donations, bequests, and devises for promoting the objects of said Society," — today, I repeat, the Society has much to be proud of. With the influence that its exhibits have exercised around us, with the value to individuals that the Society has been by holding before all people a high standard of excellence as to what can and should be striven for, — with all these characteristics, the honor and value in our membership have greatly enhanced.

Thus also is the importance to the community of this Society to be gauged and appreciated.

While serving for several years upon your Library Committee, I became familiar with the great benefits that would result from increased shelf room; and then, at the request of that Committee, you approved of suggested improvements that gave a gallery, and consequent additional shelves. A wise continuity of purchases must be made to keep useful sets of publications complete; and the purchase of needed works, when a chance offers, is an important factor in keeping your library up to date. Its natural increase is inevitable, unless it is allowed to deteriorate, and it is safe to say that the latter is not your wish, so far as is wisely within our ability.

A variety of ideas for improving the accommodation for the general purposes of our Society have from time to time been presented to your Executive Committee, or the Society, in which I have taken part. All have been either in the direction of an improvement of the present site, or a change of site, with, in either case, far better and more liberal general accommodations. All have had my approval from a certain standpoint, but it has been decided inexpedient and undesirable to adopt either plan. The noise which surrounds this building, and which has been a great detriment to our work, could be greatly mitigated were a

smoother pavement to be laid on the adjoining streets, and such would seem to be a prospective benefit to all occupants of buildings in our neighborhood. Our work is of such a *pro bono publico* character that, with a fair concurrence of those owning and occupying buildings around us, is it not reasonable to suppose that the City would grant us a hearing, with the prospect of a favorable result in this direction?

Would that it might be possible for rubber tires to be required for *all city* vehicles, and rubber heels on shoes for all city horses! Thus, until automobile vehicles come into general use, the condition of the inhabitant of the city would become mitigated by more restful surroundings.

Would not such conditions delight *our* audiences, and spur on the workers in our midst in their charitable horticultural efforts while we remain at this location?

A certain guidance and control of the direction of city traffic, with paving on the several streets and boulevards suited to their several chief uses, is, I believe, found useful from both commercial and sanitary points of view in some parts of the world, and seems an appropriate thought at this time, and a respectful suggestion for the consideration of others.

Some years ago, I am informed, the authorities having in charge the State's newly made Back Bay land made a most attractive offer to this Society (I have been told without cost) of one-half of the square of land where the Institute of Technology now stands, if they would occupy it. Acceptance was then deemed against the Society's interest, and the offer was declined from necessity.

Should such a proposition come from State or City, at some future time, where the work of this Society could be conducted under its chartered obligations, with administration and library rooms in a main structure, and with an exhibition hall of ample size and well lighted attached upon the ground level, we might find a fortunate status confronting us.

With an exhibition hall into which teams, carrying plants, could be driven, and there unloaded safely from risk of frost, and where, at times of exhibitions, the aisles would be broad enough to allow invalid chairs to be pushed without undue inconvenience to pedestrians, we should possess that ideal condition of which few other localities could boast.

But this or any other change of location can only be possible when our present quarters are desired much more by others than by ourselves. Inducements in this direction have been courted without yet meeting with sufficient success.

The Royal (national) Agricultural Society of England publishes quarterly bulletins, which form their Transactions, and which are so much in demand at sale by non-members that they are a source of income to that Society, and are issued with perfect regularity.

Why should not our Society aim to establish her Transactions upon such a basis, in due time, that they shall become as desirable in their chosen line, and in proportion to our resources, as are the English Agricultural Society's in their chosen line? Whether they filled a place before the public that would be helpful and desirable would, in part, be shown by the demand for them, and from the amount of receipts from their sale.

At least let all who now contribute to their contents or their making combine to secure the prompt issue, in proper time, of what we now publish, which certainly can be easily possible if all will remember that promptness of action, and presentation of all papers and reports in form for the printer, are necessary factors.

Certainly our members can demand the receipt of Transactions on time; otherwise they become of inferior value, and proportionately a discredit to the Society.

My intimate connection, first, with the Bussey Institution at Harvard University for several years, and later with the State's Agricultural College and Experiment Stations, for a longer time, while my interest in these institutions still continues, enables me to bear witness to the excellent work done there for the cause of horticulture and for those who would be trained in agricultural principles, or taught to become working horticulturists. I must be permitted here to call special attention to that work which is being so earnestly done at Amherst and at said University, and which is in line with the chartered objects of our Society. There is ample room for all that can be accomplished to advance the knowledge of horticulture and horticultural methods at both places; and I believe that there is no line of work, if wisely applied, that can do more to advance the conditions of the surface of this Bay State, Massachusetts, directly

and indirectly, than can horticulture, which would conduce to a more intensive or a much higher quality of farming also.

All this will benefit Massachusetts because the surface of Massachusetts — her soil and its natural growth — yield most profit from intensive treatment, intelligent treatment, and the application of the results of scientific, beneficial investigations, and study that practical application has proved useful.

The interest in School Gardens and Children's Herbariums has increased much of recent years. At the last exhibition, in December, 1898, there was not space enough in both halls for the display of the children's herbariums. The quality of the work is reported excellent by the Committee. This yearly exhibition affords botanists an opportunity to study the variations of plants grown under different conditions, and to refresh their memories with views of plants not commonly seen, under favorable conditions. The gathering of such collections incites children to begin the study of plants, and is a great influence in cultivating the powers of observation, which are useful factors in advanced study and in after life. Its educational value is plain, and the regular succession of voluntary exhibitors shows that this value is appreciated by parents and those who are interested in the proper education of children.

The study of living plants in a school garden, though more difficult to start and sustain, has still greater value. But many plants can only be studied in the dry state and with colored plates. Without life and growth horticultural pursuits are impossible, and the reports of the establishment of children's gardens, as is the case, are encouraging and indicative of the widespread influence of this Horticultural Society.

I am one who believes that the courses of instruction in our more rural schools would be much more useful to their students if more of the teachers there were trained to understand, and were directed to teach, the natural sciences; and to train those young minds more by teaching them of the wonderful ways that Nature works in, in many objects all about them.

Applicants for admission to our agricultural, farming, and horticultural institutions of learning are too often placed at a considerable disadvantage on account of no knowledge of those rudimentary studies that not only would help them better to understand more advanced instruction, but would enable them the

better to understand the practical work upon their own homes did they elect to remain there and take part in this care; this latter in addition to the increased power of observation that I have already mentioned.

Recognizing, as we do in our Society, the value of herbariums, I wish to take this opportunity to call attention to the merits and needs of the Gray Herbarium of Harvard University. This large collection of scientific specimens of plants has been developed through a long period of years, and with great care. It has formed the basis for the publication of many of the best botanical works produced in America, and its staff has for years been ever ready to give expert determinations of plants submitted for identification. The importance of having in our region an establishment of this kind should be clear, not only to botanists, but to all who are interested in horticulture, pharmacy, or any other occupation in which critical discrimination of plants is of fundamental importance. Through the scientific activity at the Gray Herbarium hundreds of newly discovered plants have been described and classified. Many of the species thus brought to light have a high value in horticulture, while others possess important therapeutic qualities. There is still much to be done in this way, and good reason to believe that the further scientific classification of plants — by bringing out species of economic value, new drugs, important acquisitions for horticulture and agriculture — will contribute much to human welfare and happiness. For these reasons it should be a matter of interest that one of the oldest, largest, and most thoroughly equipped herbariums in America should receive the support of which it now stands in pressing need.

During the past year we have authorized a permanent Committee on Forestry and Roadside Improvement, composed of most competent men, but it has been found difficult to prepare any form of action as yet. Perhaps legislative matters may be so presented that opportunities will be soon offered which will invite the action of the Society through our Committee.

Forestry and roadside improvements are most important factors in the teaching of economic action and care in the State's agricultural conditions. We must study probable future needs to decide what is best for us to do today in such matters, and be influenced by past experiences, in our own and other countries, in coming to conclusions.

In terminating these brief words of address I want to express, first, a regret. I had tried to find some complete account of those homes and gardens of early Boston which were once conspicuous for their distinguished architectural effect in the buildings and fences, and which marked an early period of horticultural beauty, effort, and appreciation of that art. My regret is that *in no single work* have I found so complete a collection of descriptions of those historic homes and gardens as is deserved by the facts.

Such a publication is certainly an omission in the history of this city, which, I believe, has made and is still to make history for itself of a truly noted and advanced character, considered æsthetically as well as from a business standpoint.

A beautiful work upon the more recent public buildings in this city has lately issued; may it be possible for a parallel work to issue on the historic subject to which I have referred? Had the "touch the button and it does the rest" kodak existed, in those early days, many such a work would have issued long ago; but memory must now be the kodak from whose films alone can such a work be completed.

And in conclusion, fellow-members, while we continue to remain in this building, and on this site, we must adapt ourselves to it as best we can; and make the most of its opportunities, overriding its inconveniences, if we cannot eliminate them.

I have been helped by a considerable number of people in presenting to you the several plans that I had hoped might be possible of execution, and I desire to thank them for their unsuccessful coöperation.

It is possible that a temporary stack-room for books, above our stairway in the front hall, with openings from the gallery, might relieve the very congested condition of our books, and bring many volumes into use that now are buried and sought for. I ask that the Library Committee give this matter consideration again.

Let me appeal to the Chairmen of all Committees again, to have all lectures and their reports ready early for the printer, so that they may not be a factor to prevent the prompt issue, in future, of our Transactions.

I have deemed it a distinguished honor to be permitted to hold the office of President for what will have been — God willing —

four years on Jan. 1, 1900, and I trust that this last year before we commence on the nineteen hundreds may see good work done to promote that which will be best for this Society under its chartered objects.

Hon. Virgil C. Gilman moved that the thanks of the Society be presented to the President for his annual address, valuable both for its historical information and its practical suggestions. This motion was unanimously passed, the question being put by Vice-President Benjamin P. Ware. The President briefly expressed his pleasure at the appreciation by the Society of his address.

The appropriations reported by the Executive Committee on the first Saturday in November, 1898, came up for final action, and were unanimously voted, as follows:

For Prizes and Gratuities for the year 1899:

For Plants	$2,000
For Flowers	2,668
For Fruits	1,732
For Vegetables	1,200
For Gardens, Greenhouses, etc.	500
Total	$8,100

The President, as Chairman of the Executive Committee, reported a recommendation that the Society make the following further appropriations for the year 1899:

For Gratuities for Native Plants	$50
For the increase and preservation of the Library	1,000
For the Committee on Lectures and Publication, this sum to include the income of the John Lewis Russell Fund	300
For the Committee of Arrangements, this sum to cover all extraordinary expenses of said Committee	400
For the Committee on School Gardens and Children's Herbariums, this sum to cover all incidental expenses of said Committee, and to be paid through the usual channels	250
For the salaries of the Treasurer and Superintendent and Secretary and Librarian	3,000

This report was unanimously adopted, and the appropriations recommended were voted.

The President, as Chairman of the Executive Committee, reported that that Committee had appointed Charles E. Richardson Treasurer and Superintendent of the Building, and Robert Manning Secretary and Librarian, for the year 1899.

Joseph H. Woodford announced the decease of Charles N. Brackett, for thirty-two years Chairman of the Committee on Vegetables, and nominated Warren Howard Heustis as Chairman of the Committee on Vegetables, and Joshua C. Stone to fill the vacancy in the Committee. After some discussion it was voted that the Secretary cast one ballot for these gentlemen, which was done, and they were declared by the Chair to be duly elected.

On motion of William C. Strong, it was voted that the Chair appoint a Committee of three to prepare a memorial of Mr. Brackett, and Mr. Woodford, Mr. Heustis, and Varnum Frost were accordingly appointed.

On motion of Henry L. Clapp, Chairman of the Committee on School Gardens and Children's Herbariums, it was voted that all premiums and gratuities awarded by that Committee be payable on the first of January, after such awards are made, as are all other awards.

The President added William P. Rich to the Committee on School Gardens and Children's Herbariums.

It was announced that the Schedule of Prizes for 1899 was ready, and also that a statement of the changes therein from the schedule for 1898 had been printed for distribution.

Also that the programme of lectures for the season of 1899 was ready, and the first lecture was announced by the President.

The meeting then adjourned to Saturday, February 4.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, January 14, 1899.

A meeting for Lecture and Discussion was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

This lecture was delivered on the John Lewis Russell foundation. The Committee regret that they are unable to present more than the following synopsis of it:

ANCIENT AND MODERN THEORIES OF DISEASE, WITH SPECIAL REFERENCE TO DISEASES OF PLANTS CAUSED BY PARASITIC FUNGI.

By WILLIAM T. SEDGWICK, Professor of Biology, Massachusetts Institute of Technology, Boston.

Perhaps next in importance among the great scientific discoveries of the century to the establishment of the theory of evolution has been our progress in the knowledge and interpretation of disease, whether of plants or of animals. In this direction the change in our point of view within the last hundred years has been enormous, and it is interesting and instructive to review briefly the history of opinion in regard to the causes of disease. Before doing this, however, we shall do well to remember that zoölogy and botany are now regarded not merely as distinct sciences, but also as hemispheres of one greater science, biology. In order to show the practical value of this point of view it need only be remembered that if plant life and animal life are, as we now believe, essentially similar, plant diseases and animal diseases may well resemble each other not only in character, but also in origin, and even as regards prevention.

Assuming the fundamental similarity of constitution and behavior which it is now admitted prevails between plants and animals, we must next remember that, in the words of Huxley, "the fundamental conception of a living body as a physical mechanism . . . is the distinctive feature of modern as contrasted with ancient physiology." Health and disease thus become to physiologists terms of precise and definite meaning, indicating, as they do, actual states or conditions of a living body. A moment's consideration will show that it is essentially no more difficult to comprehend the idea of a general state or condition of

a living body than a general state or condition of a lifeless body, such as a stone, a piece of iron, a watch, or a locomotive. Very much in the same sense that a watch is a time-piece, a living body is a life-piece. If a watch appears to be in good order and running well, we say that it is a good and normal time-piece, and if a plant appears to be in good order and doing well, we call it a normal or healthy plant, but if it is out of order, or not doing well, we say that it is in a state of disease. Health thus becomes the normal and disease the abnormal condition of the living mechanism. Again, the living machine may wear out. No matter how well cared for or how cleverly managed, old age finally creeps over it; and death is the final stoppage of the vital machinery.

A modern, scientific, and helpful view of the causes of disease is one which classifies them according to their place of origin and regards them as either (a) Intrinsic, or arising from within the body proper; or (b) Extrinsic, or arising outside the body or acting upon it from without. In other words, diseases may be held to be due either to defects in the constitution or construction of the vital mechanism — its timber or its workmanship — or else to external or unfavorable influences acting upon it. In other words, diseases may be said to be, according to their place of origin, either Constitutional or Environmental.

The human race in its development has held various and curious theories of disease both in respect to the diseases of plants and those of animals, but especially the latter. Savages and barbarous peoples, being eminently subjective, interpret diseased states or conditions as perversions of conditions like their own, with which, of course, they are most familiar. If, for example, they observe a person who is inattentive, unresponsive, or otherwise peculiar, they are apt to think of him as "absent-minded," or "out of his head;" but if absent-minded or out of his head, what more natural than that some demon should enter his head, take his place, and act strangely, or cause his body to act strangely in his absence. In this way savages and others have accounted for lunacy, hysteria, epilepsy, and delirium; and traces of such theorizing are common even today.

In the classical period a more physical and mechanical idea, one more in harmony with nature, prevailed, but yet sufficiently strange. This was the famous theory of the four humors. Traces of it linger until today. This theory supposed that health

consists in the proper mixture, and disease in the improper mixture, of four juices of the body, namely, blood, phlegm, yellow bile, and black bile, and today, even, we hear not infrequently of the "sanguine" temperament, the "phlegmatic" temperament, and the "melancholy" (black-bile) temperament.

With the growth of science and the study of health and disease, especially the study of anatomy and physiology, in the sixteenth and seventeenth centuries, the modern idea of the organism, whether plant or animal, as a physical mechanism, gradually grew up and our modern idea of the constitution or construction of the plant or animal body came into being. Little by little also the idea of the close relationship which subsists between organisms and their environments was developed, and when, in 1839, a disease of the scalp of man was traced to a parasitic fungus, while another fungus was found to be the cause of an infectious disease of silkworms, the foundations were laid for the modern "germ" theory of infectious diseases, which regards such diseases as due to microscopic organisms, many of them parastic fungi operating upon the plant or animal body from the environment.

A recognition of the dependence of plants upon environmental conditions was of course very ancient. We are told in the Bible of the barren fig tree which was saved, temporarily at least, from destruction by the proposition of the gardener to alter its environmental conditions by digging about and dunging it. We even have a recognition of parasitism in the case of the gourd which grew up and sheltered Jonah while he impatiently waited for the destruction of Nineveh, inasmuch as it was a worm which was sent in the night to attack and destroy the gourd. It is said that Pliny recognized the parasitism of the mistletoe. Very early, also, the excrescences which appear upon trees and other plants were interpreted as parasites, or at least as monsters, by virtue of their obvious analogy to certain so-called parasitic growths attached to human monsters. The term "parasite," although so common now in botany, is derived from animal life, a parasite being a person who, unbidden, eats beside another. The term is said to have been introduced in its modern sense into botany as recently as 1720. The microscope was a necessity before it was possible to discover most parasitic fungi.

Parasites were for a long time confounded with epiphytes. Parasitism seems, indeed, not necessarily, as is usually supposed,

an abnormal and strange development, at least in its beginnings, but simply a natural result of the universal struggle for existence. If, in the search for food, a plant or animal happens to come in contact with and feed upon another, it may easily happen that it shall gain great profit, but if this habit becomes so extended as to lead to the destruction of the host, obviously the parasite itself will also perish. It is easy to suppose that parasitism may have arisen from saprophytism, in which plants and animals feeding upon dead or waste organic matters happened to attach themselves to living plants or animals; and it is easy to see how, under these circumstances, great advantage might accrue to the saprophyte. It is even possible to imagine how the ranks of parasites, thinned by the destruction of their hosts, or otherwise, might be continually recruited from among the saprophytes.

The parasitic fungi have long been known in special cases to penetrate the tissues of their host. It has also been known that in their doing of this some solvent reagent was secreted by the fungus, and recent experiments of much interest have shown that it is possible to separate from particular fungi substances which will corrode and destroy vegetable tissues such as are attacked by similar fungi. The analogy here discoverable between the toxins of bacteria and these solvent reagents, or tissue-poisons, is very close, and we are obliged today to employ a similar term to describe the precise action of parasitic fungi to that now employed in bacteriology and to call the diseases which they produce not merely "zymotic," but rather "zymotoxic."

The chief practical importance of a clear understanding of the terms "health" and "disease" in botany is that we may the more readily comprehend the lines along which prevention of disease and the promotion of health must work. Obviously there are two directions, and only two. First, in the improvement of the mechanism, and second, in the control and amelioration of the environment. The former is a problem for plant physiologists for plant diseases, precisely as it is one for animal physiologists for animal diseases. The latter bears the same relation to plant life that sanitary science does to animal life, and there is reason to believe that the next few years will witness immense progress in the field of preventive medicine, or vegetable sanitation, for plant diseases. Sanitary science for plant life must follow essentially the same lines as for animal life. The prevention of the environmental

diseases of plants will consist in the one case, as in the other, largely in the control of parasites and the study of proper atmospheric or other environmental conditions, such as food and drink. It must consist in the promotion of cleanness, in the provision of a water supply free from infectious material, in the use of clean and wholesome utensils, in the abatement of dust, and the avoidance of infection from all sources.

Side by side with this control or amelioration of the environment will go eventually an important series of studies in the improvement of the organism itself considered as a physical mechanism. Unlike the history of the betterment of animal life, progress has been thus far in the improvement of plant life greater, perhaps, on the constitutional side, the destruction of the weak and sickly being tolerated among plants more even than among domestic animals, while it is absolutely out of the question in the human species. The greatest immediate improvement, therefore, in the control of the activities of parasitic fungi is likely to be along those lines where the greatest progress has already been made in animal sanitation, namely, in the control and improvement of the environment and in the establishment of a veritable hygiene or sanitary science for plant life. Whether this will go so far as to lead to the reënforcement of the organism by the antitoxins which shall neutralize the poisonous effects of the toxins produced by parasitic fungi or other enemies of plant life remains to be seen, but it is by no means impossible.

On motion of Benjamin P. Ware, introduced by brief complimentary remarks, a vote of thanks was given to Professor Sedgwick for his interesting and instructive address.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, January 21, 1899.

A meeting for Lecture and Discussion was holden today at eleven o'clock. Neither the President nor either of the Vice-Presidents being present, Ex-President WILLIAM C. STRONG was elected chairman *pro tem.*

The following lecture was delivered:

Experimental Work in Field and Garden.

By Hon. Aaron Low, Hingham.

Mr. President and Members of the Massachusetts Horticultural Society:

In conducting experimental work on agricultural subjects there are so many contingencies to be taken into consideration, as to the changes of each season, that to demonstrate fully the value of any series of experiments they should be conducted through a number of years.

In an experiment conducted in a season like the one just past, which for the larger part was unusually moist, and with but a comparatively small amount of sunshine, the conditions of strong, healthy growth are wanting, and experiments conducted under such circumstances will surely fail of being satisfactory.

Every one who has studied into nature's laws finds how unerringly those laws perform the duties for which they were created.

In experiments the past season with varieties of vegetables, which, to grow successfully, and insure the development of the best qualities, must have an abundance of sunshine, they must, in the lack of that condition, have proved inferior in quality and product.

As the object of this paper is to give the results of experiments the past season with a variety of vegetables, there may be something learned from failures as well as from the most successful results.

I will, therefore, give you briefly a statement of the several experiments, and if there are points which may be of benefit to you in your future farming operations, the experiments will not have been made in vain.

As the experiments were made on but few of the many kinds cultivated, if those present desire to discuss the merit of any of those varieties omitted, we shall be pleased to do so; also, any question connected with the experiments given I will gladly answer.

Experiment No. 1. — As the Pea is one of the first vegetables to be planted in the spring, and quite an important crop for early marketing, I would first call your attention to an experiment in its cultivation.

A piece of light sandy soil was ploughed April 16th and planted on the 17th as follows: Rows were furrowed three feet apart; blood, bone, and potash fertilizer was scattered in the drills and well mixed with the soil. The varieties planted were two rows of Alaska, two rows of Nott's Excelsior, and two rows of Advancer. The vines grew finely and bore abundantly. The Alaska was the earliest, giving peas well-filled June 20th. Nott's Excelsior June 23d. The Advancers were not in condition for picking until July 6th. Nott's Excelsior is similar to the American Wonder in size of pod and fineness of quality, but as it is a much stronger-growing variety it will be likely to supersede the Wonder. The second plot in my pea experiment was planted some ten days later, and the All Soluble brand of fertilizer was used. The varieties planted were Nott's Excelsior and American Wonder. There was not much apparent difference in the two varieties except in the stronger-growing vine of the Excelsior. The All Soluble fertilizer is very quick in its action upon crops, but appears deficient in carrying them out to the end of the season.

Experiment No. 2. — My second experiment in planting was with Sweet Corn. As this was on land alongside of that of the Pea experiment it was ploughed at the same time. On the 29th it was harrowed and furrowed in rows three and one-half feet apart. The fertilizer used was blood, bone, and potash, a handful being dropped in the drills three feet apart, and well mixed with the soil. The corn was dropped on April 30th and covered lightly with a hand hoe. The varieties planted were as follows: two rows each of Early Melrose, Early Champion, Early Crosby, Early Quincy Market, Low's Perfection, Bear's Foot. For so early a planting the seed came up well, and as there were no late frosts to injure it, grew without hindrance. The Quincy Market was a week the earliest, followed by Perfection and Early Melrose. There was no perceptible difference in appearance or earliness between the Early Melrose and Early Champion. Both varieties in color of stalk and manner of growth were so similar, I should decide they were the same variety. Early Crosby, although one of our best kinds, was not as early as I expected. Bear's Foot is a new variety of much promise, having a large stout ear with from sixteen to twenty rows on many ears and, the kernels being very sweet and tender, is well worthy of a trial.

Experiment No. 3. — My third experiment was on Potatoes.

As this crop is one of the most important which the farmer grows, I was desirous of embodying as many points in relation to its culture as possible, in the hope that by varying the usual routine of planting I might acquire some ideas which in the future would be of much benefit.

In the first week of April I selected the most uniform tubers I had of the following kinds: Early Fortune, Early Essex, Pearl of Savoy, Early Harvest, and Early White Ohio, and spreading them out on benches in the glass house left them to the full influence of the heat and sunshine until May, when I saw that the eyes had started nicely, and grown stout green sprouts from half an inch to an inch long.

In placing potatoes under glass always put them out singly, as they must have the full benefit of light as well as heat to start strong green sprouts, which is a very important point, as, if grown light colored, they will rub off very easily, and cannot be handled; while if grown under the full influence of the light the eyes start strong, and they can be handled without injury in putting them out.

As the land on which this experiment was tried was a part of the field of the previous experiments, it was ploughed at the same time. On the 3d of May it was well harrowed, and furrowed in rows three feet apart. Armour's blood, bone, and potash fertilizer was scattered in the rows at the rate of half a ton to the acre, and well mixed with the soil before setting out the potatoes. As this was a special experiment on starting potatoes well before planting out, I did not take the tubers from the glass house until May 4th, when the eyes had strong vigorous sprouts from half an inch to an inch long. The potatoes were carefully cut to two eyes to a piece, and placed in the bottom of the drill one foot apart, and all sprouts covered from two to three inches deep, with light soil.

As the weather was favorable, they soon made their appearance above ground and, not being troubled by late frosts, grew finely. As all the kinds planted were early, the vines seemed to be fully grown before the potato beetles made their appearance, and were not much troubled by them.

The piece was cultivated twice; at the last time the rows were ridged slightly, but no hand hoeing was given. The first potatoes were dug on June 22, and were of good size, smooth and handsome, and of fine quality. The potatoes were all dug by the 20th

of July, and averaged six bushels to a row two hundred feet long, of large, smooth, handsome potatoes, without any signs of scab upon them.

The above experiment was very satisfactory in showing the advantage of starting potatoes very early, as they make most of their growth before the potato beetle appears, and mature the tubers before the blight usually comes.

Of the varieties planted Early Fortune and White Ohio were new. The first named was one of the earliest, and first class in all respects. The Ohio I should not recommend from this trial, as the tubers were small and inferior in quality, while all the others were large and very handsome. The conditions of growth seemed perfectly suited to all the varieties except the Ohio.

Experiment No. 4. My next experiment was also on Potatoes, but was conducted on different lines: First, to determine if possible the difference, if any, in value of Seed Potatoes grown in different latitudes as well as the comparative value of the prominent varieties now in cultivation; Second, to determine the efficiency of various methods to prevent scab on the tubers and blight on the vines.

In accordance with the first part of the experiment I selected the following varieties of potatoes from different latitudes, two rows fifty feet long of each kind:

Early Harvest, from New York.
" " our own seed.
New Queen, from New York.
" " " Maine.
Rural New Yorker, No. 2, from New York.
" " " " " Maine.
Carman, No. 1, from New York.
" " our own seed.
" No. 3, from New York.
" " our own seed.
Rochester Rose, Gregory's seed.
Prolific Rose, " "
Honeoye Rose, from New York.
Enormous, from Vermont.
Uncle Sam, from Henderson, New York.

The potatoes were planted May 15, on commercial fertilizer, scattered in the rows at the rate of 800 lbs. to the acre, and well

mixed by horse and cultivator before dropping the potatoes. They were also covered by horse and cultivator, and all after-cultivation was performed in the same manner.

After the potatoes came up they grew well for a time, but as there was so much wet weather with but little sunshine the vines did not show such a stout, vigorous growth as when conditions are more favorable. Paris green was applied twice as a preventive of the potato beetle. The first week in July there appeared in spots on the vines of the earliest varieties a blight which soon spread over the kinds on which it was first seen. I immediately applied the Bordeaux mixture to the later kinds before the blight was to be seen on the vines, but rain followed in a few hours, washing the application off before it had time to be effective. I again applied the mixture at two different times, but each application was immediately followed by rain, and the effect was much impaired.

The varieties that withstood the blight the longest were Carman No. 1, Carman No. 3, Enormous, and Uncle Sam, all late potatoes.

Although the application of the Bordeaux mixture in this instance was not as effectual as I expected, still I believe that under favorable conditions it would well pay for thorough application early in the season by checking the blight on its first appearance and giving the vines a longer time to perfect their crop.

In preventing the scab on the potato, the remedy most highly recommended is soaking the seed potatoes in a solution of corrosive sublimate for an hour and a half, as per the formula of the Experiment Station at Amherst. Another method of prevention is to scatter flour of sulphur in the rows when the potatoes are planted.

I could not see any perceptible difference in the results of either method, as the potatoes in both cases were free from scab, while where neither was applied many of them were scabby.

The yield of the several varieties was as follows:

The 2 rows of Early Harvest,	N.Y. seed.	2	bushels.
" " " " " "	our own seed.	$2\frac{1}{4}$	"
" " " " New Queen,	N.Y. "	$2\frac{1}{2}$	"
" " " " " "	Me. "	3	"
" " " " R. N. Y. No. 2,	" "	$2\frac{1}{2}$	"
" " " " " " " " " "	N.Y. "	$2\frac{3}{4}$	"

The 2 rows of Carman No. 1,	N.Y.	seed.	2¾	bushels.
" " " " " " "	own	"	3	"
" " " " " " 3,	"	"	3¼	"
" " " " " " "	N.Y.	"	2¾	"
" " " " Rochester Rose,	Gregory's	"	3½	"
" " " " Prolific Rose	"	"	3	"
" " " " Honeoye Rose	N.Y.	"	3	"
" " " " Enormous,	Vt.	"	4	"
" " " " Uncle Sam,	N.Y.	"	3	"

The variety giving the largest yield was Enormous, a late potato from Vermont. The next was Rochester Rose, from James J. H. Gregory. The third was Carman No. 3, our own seed.

Within a few years there has been much discussion at farmers' meetings as to the best method of restoring exhausted or worn-out lands to a productive fertility. Experiments have been conducted at Experiment Stations with various plants, to determine their relative value in restoring the needed elements of fertility to the soil. A number of plants have been imported from foreign countries, which were said to be particularly adapted for this purpose in the immense amount of green material they produce for ploughing under. The past two years I have tried a number of those recommended, and will briefly give the results.

Australian Salt Bush. — This is said to flourish and grow in the driest localities, where even grass and other forage plants will not live, and to produce heavy crops of nutritious food for stock. Perhaps from extreme moisture of the past season the result was not as good as I expected; evidently there was too little sunshine for its perfect development. It is of trailing habit, each plant covering the ground for several feet. It has small narrow leaves, thickly set on slender branches. Cattle, sheep, and hogs are very fond of it, and it is said to be exceedingly nutritious. I shall give it another trial, trusting that the season will be more favorable.

Dwarf Essex Rape. — This is a plant highly spoken of for green manuring, producing immense weight for that purpose; it is also said to be twice as nutritious for fattening stock as clover. It can be sown from May until July, is a rapid grower, and will furnish by the middle of September as large a crop as can well be ploughed under. I sowed between one and two acres in June, and when turned under in September it was from one to two feet high.

Rye was immediately sown upon the land, and next May I shall plough under the rye crop, planting the land at once to corn, thus testing the value of green manuring on light sandy soils.

Cow Peas have a very high reputation, especially in the southern part of our country, as a renovator of worn-out lands. They can be sown in May or June, from one to one and one-half bushels per acre, and should be ploughed under as soon as they have made their full growth. They are very prolific in seed, bearing from twenty to twenty-five bushels per acre. The vines are much relished by all farm stock.

Soja Bean. — This is the most highly recommended by the Experiment Stations for ploughing under as green manuring of all known plants. It is the greatest gatherer of nitrogen from the atmosphere during growth; when ploughed under it returns to the soil a large per cent of that element in its most available form. My experience with this the past season was very satisfactory. It grew strong and stocky, and when ready to plough under was two feet high. This seemed to be more hardy to withstand early frosts than the Cow Pea, as the first frost, last fall, killed the peas, but did not harm the beans growing alongside.

The Soja bean can be sown either broadcast or in drills two feet apart. I prefer the latter method, as the cultivator can then be run between the rows, thus keeping the land free from weeds. It is productive of seed, which, ground into meal, is said to be excellent for stock feeding.

Winter Rye. — For a number of years I have practised sowing winter rye on all lands available in the months of August and September, using from one and one-half to two bushels of seed. This will form a thick matted growth before winter sets in, and will be a good protection from the wash of heavy rains or from the soil being blown off by strong winds.

Winter rye, to the farmers of Massachusetts, is more available than any of the plants before noticed. Produced as it is in almost every town, it can be readily and cheaply procured at any time when needed for sowing.

I desire to emphasize the utility of ploughing under green crops, to every farmer who has light, sandy soil, as a restorer of a much needed element of fertility, which long cultivation has largely exhausted. There is no other means by which such lands can be as cheaply and rapidly brought back to productiveness. Another

important point in favor of ploughing under green crops is the marked resistance to drought which crops growing upon it always show. I have often noticed quite a difference in the same field where only a part of the crop was growing on green manuring.

In growing cabbages on land where rye was ploughed in, I have noticed their entire freedom from destructive insects, in marked contrast to lands adjoining on which cabbages were growing without the green manuring, the cultivation in all other respects being the same. On a piece of cabbages grown the past year, every plant set lived and formed a large solid head, which to me was conclusive evidence of its utility.

We often hear farmers and market gardeners say that they have more confidence in the applying of a heavy dressing of stable manure than any of the commercial fertilizers sold in the market. There is no doubt of the reliability of stable manure as applied to the market gardens in the vicinity of large cities. In many cases it costs only the hauling, and, when bought, is got at a very low rate. The farmers and gardeners living out in the country, from fifteen to twenty miles away from the city, cannot afford to buy stable manure at the price usually asked for it, as the cost of teaming and handling, when delivered on his farm, brings it at too high a figure to leave any profit on its use. In an experience of twenty years in using both stable manure and fertilizers on almost all kinds of garden vegetables, I have come to the conclusion that I can grow better crops on the same amount of money's worth of fertilizer than of stable manure.

The question is not as to the reliability of stable manure to produce good crops with the country farmer, but the amount which those crops cost him, and when the cost is more than the product returned he must endeavor to reduce its cost. I firmly believe that farmers, by using a high grade of fertilizers or chemicals, supplemented as it can readily be by ploughing under green crops, can produce most of their crops at a less cost than when using stable manure.

As the object of our Society's meetings is to call out from those present their individual practice and experience, I trust that the paper I have given you will call out a free interchange of your own ideas and experiences upon the subjects noted. I shall be pleased to answer such questions as may be asked in regard to any of the subjects mentioned.

DISCUSSION.

At the close of the lecture the Chairman remarked that the audience had been very much pleased with the lecture.

Thomas Harrison inquired whether the lecturer had ever made use of the manure spreader, which cuts up the manure. He thought that manure spread in the usual way does not give its full effect the first year.

Mr. Low said that some years ago he used the manure spreader; it saved labor and spread the manure in better condition. The time for manuring in hills has passed by.

Varnum Frost inquired what the condition of the soil was.

Mr. Low replied that he came into possession of the land in 1892. From that time it has been cultivated; previously it had had little manure. In such cases the vegetable mould is pretty much exhausted, and green crops ploughed in are as good as manure. If he had a thousand cords of stable manure he would prefer to buy fertilizers to use in growing potatoes, as the tubers are smoother and of better quality.

Some one asked the lecturer whether he could raise poor potatoes on new sward land, and Mr. Low replied that on sward land potatoes are usually good.

George D. Moore asked about ploughing in stable manure lightly in the fall.

Mr. Low said that the gain of ploughing in manure in the fall is that the manure becomes more soluble. This is a great advantage over ploughing it in in the spring; it has become more soluble when it is time to plant.

Mr. Harrison thought that that might be wasteful in light soils, on account of the manure leaching through.

Mr. Low said that it would be safely imprisoned by frost. Nitrogen applied in the fall is thrown away. Nitrogen and potash on rhubarb in the spring will work wonders.

The Chairman asked whether the roots on the potatoes in the glass house struck into the ground where they lay on it.

Mr. Low said that he had had potato eyes sent by mail. He has handled the sprouts when six inches long, and would emphasize putting the tubers out singly in the glass house. He lays them on the earth without any covering, and waters them as you would otherwise. He said he knew a man who many years ago

multiplied the Early Rose to an extraordinary extent by sprouts and cuttings taken from them.

The Chairman said he should suppose that potatoes would make numerous roots where they lay on the ground. Many years ago he propagated the Early Rose potato, beginning with a little more than a peck. He cut the tubers and placed them on sand, from the sprouts he took cuttings, and planted in pots. The tendency of these cuttings was to make numerous roots and many small tubers.

Mr. Low said that the eye that lies on the ground would make many roots and the potato must be turned. Every eye will give a good sprout if rightly managed.

Mr. Low said in answer to an inquiry that it would be just as well to put the tubers on boards if you would water them two or three times a day. If they made many roots there might be danger of the shoots becoming drawn and weak.

Joshua C. Stone said that nobody would deny that it does land good to rest. But where land is so dear as it is in the vicinity of Boston this is impossible. He never lets the land lie idle.

Mr. Low said he had some rye sown in December ploughed under the last week in May when two feet high. He ploughed under a crop of soja bean, and has got four crops of green manure and has lost only one crop. Cow peas absorb nitrogen during growth, and when lying on the ground in winter protect it.

Mr. Stone said that land could be so heavily manured and cropped that it would become worn-out. He calculates to manure all his land twice a year, and applies twenty cords of stable manure to the acre. He would put half his farm down to grass three years and let it rest if he could afford it. It would be the better for the next five years. He said that he did not know about potash, but he puts on extra potash when he thinks the land needs it. He thought he should have less of blight and disease if he could use green fertilizers.

Mr. Frost said he should not think of planting potatoes on old garden soil.

Mr. Low said that he would plant anything that is green for green manuring. He planted two crops, and on one of them there was a crop of weeds which he turned under. The onions that were taken from this last lot were superior to those which were taken from the lot where weeds were not ploughed under. Another plant valuable for green manuring is the vetch.

Walter E. Coburn said that he cut potatoes lengthwise and put the cut side down.

Mr. Low said it would certainly be a good way to do if one had plenty of glass room. He cuts out sprouts with the point of a knife.

Mr. Harrison said that farmers in Canada on one acre of clover could raise 2,000 lbs. of pork. There was no resting of the land and no loss. Hogs will feed on clover.

Mr. Low said that if clover was sown very late in the fall it must be sown again in the spring. It must be well rooted to stand through the winter.

J. H. Woodford said that farmers who use twenty cords of manure per acre fill the ground with manure, and he thought that where that happened it would be better to omit manuring occasionally and dress with lime.

Mr. Low said that when land is surfeited with stable manure lime is beneficial. Manure causes an excess of acid which lime corrects.

Mr. Stone said that he bought a hundred barrels of lime which had been injured by fire. He said that using fertilizer on land was like making mince pies — you could not tell what conditions had led to the results. A farmer might plant a row without manure and you could not tell about the results. Lime is useful, especially on heavy land.

Mr. Harrison thought that lime was of great service in many cases.

Mr. Stone said that the lime which he bought was not hurt for agricultural purposes; it was all in lumps, and he let it slack with rain. Lime which has been slacked three or four months is of no value.

Mr. Low said that corn, crimson clover, Dwarf Essex Rape, or *Lathyrus sylvestris*, will fatten a drove of hogs quickly. By the third year roots will run down twenty-five or thirty feet on the most arid soils.

Mr. Harrison said that he sows rye, cuts it off in the spring, and follows with fodder corn. He had a remarkable crop also in another case.

Mr. Low said that the trouble with rye is that it hardens too quickly, so that the cattle will not eat it.

Mr. Woodford said that alfalfa was grown very largely in Cali-

fornia and the West, and spoke of a case where four acres of alfalfa kept fourteen head of cattle and horses. He asked his son, in Kansas, why he did not grow alfalfa. His son put in alfalfa, and two years afterwards he was pasturing his hogs on this field, and they had no other food. Some of the plants sent their roots down seven or eight feet. His son cut the alfalfa he keeps for haying three times a year. The speaker thought it could be grown here.

Mr. Low said alfalfa was not adapted to our Northern climate. Crimson clover will grow well in summer time, but does not succeed in winter.

Mr. Woodford said that the climate of Kansas was similar to this.

A. W. Cheever said he had tried it many years ago and had cultivated it carefully. It lived for some years, but never amounted to anything. It was not adapted to this climate. Not one in a hundred will succeed with it.

James Fisher said he had known of ten crops being cut in California.

A vote of thanks to Mr. Low was passed for his very practical essay and for the answers which he had so kindly given to the questions asked.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, January 28, 1899.

A meeting for Lecture and Discussion was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

The following lecture was delivered:

PEACH CULTURE.

By J. H. HALE, South Glastonbury, Conn.

Probably no branch of commercial horticulture is receiving so much attention at the present time as peach orcharding; older residents of this Commonwealth remember the time when peaches for the family supply were an annual production on nearly every farm. To be sure, many of them were seedling varieties of not very high

quality, yet the most luscious of the then known varieties were freely grown by our best horticulturists.

Changed climatic conditions and the scourge of yellows practically wiped the peach trees off the face of the earth in New England thirty or more years ago, before the commercial importance of fruit growing in its present proportions had been foreseen.

For some years past we have been studying the peach and its needs for this latitude, and at the present time there is a genuine revival of peach culture, not only for the family supply, but as a commercial enterprise on many New England farms in this and other New England States.

The only reason that peaches are not grown in abundance in New England is the winter killing of the buds. In Maryland, Delaware, and other sections of the country where the trees do not suffer from winter freezing, the blossoms are sometimes forced out in the early spring and afterwards injured by frost.

A great deal depends on the intelligent selection of soils and varieties. In New England high lands are essential to peach culture. Seek a location giving as even a temperature as possible. Frost behaves much as water does, so that elevated land, dropping off suddenly, is most desirable. A well drained, naturally dry soil is best. Thorough drainage is necessary; peach trees will not grow with their feet wet. We have been growing peaches of the Persian family; also varieties from South China. Another type from North China, which we are just getting acquainted with, seems to be more hardy than the Persians. The most notable among the North China peaches is the Elberta. The Early Rivers is one of the hardiest peaches. Some think that Mr. Rivers really had a seedling of a North China peach without knowing it. The Crawford will thrive better on a clayey soil than on a sandy loam. The best soil, all things considered, is a light, sandy loam.

The peach industry tends to increase the value of land. Let ordinary farm land be developed into a peach orchard and all the land in that vicinity will immediately command $200 or $300 an acre.

The land about the average home is rich in nitrogenous matter, and peach trees planted in this soil will make rapid growth and produce splendidly for one or two crops. But such rapid growth makes soft wood, and the trees will soon die. If we want our trees

to live long and be happy we must not give them too much nitrogen. I would prefer poor soil to a very fertile one, and would feed it, but would avoid stable manure. Fertilizers rich in phosphoric acid and potash give ripe, hardy wood, and may be used freely. Potash adds to the color and quality of the peach.

For peaches prepare the soil as for any other crop with which you wish to succeed. The land cannot be ploughed too much. I recently visited the farm of General Bidwell, in Chico, Cal., a magnificent farm of forty thousand acres, cultivated with the steam plough, etc. An adjoining lot of land of five hundred acres, belonging to a lady, was ploughed with a good pair of horses and steel plough, and thoroughly harrowed, and on this land the amount of wheat raised was more than double that raised on the same area of the former farm. Plant in the spring. You cannot plant too early. Set the trees from sixteen to twenty feet apart each way. I set mine thirteen feet apart, which is too close, yet I make it pay. In one orchard I planted half the trees eighteen feet and the other half twelve feet each way, but by mistake got them only eleven and one-half feet apart. A careful account of the expense and yield has been kept. The close planted had to be fed more and pruned more, but at the end of twelve years were $7,000, net, ahead. At thirteen years the wide planted began to gain on them, reducing the balance to $5,000 or $6,000. Close planting means an everlasting pruning of trees. Medium-sized trees are the best to plant. Nurserymen charge more for large trees, but they are no better. Get trees a year old, from four to five feet high and three-fourths of an inch in diameter at the base. Don't worry if they come from the nursery without a great quantity of fibrous roots. I cut them all off smoothly from two to four inches long. Prune the top to a single stem about fifteen inches long. Don't put in any fertilizer around the tree when planting. Use nothing but fine earth; the fertilizer may be spread on top.

It is a mistake to attempt to grow crops between the trees. If you are a thorough cultivator, and crowded for room, you may plant low-growing crops. But this should be done when the orchard is young, before the trees come into bearing. I should have nothing but peaches in a peach orchard, except a horse, harrow, and plough. If your land is thin, and commercial fertilizers are insufficient, you may obtain nitrogenous matter by sowing

green crops. I sometimes use cow peas. Sow in midsummer, let them die, and plough in in the spring. Bank the trees to prevent them from swaying and to protect them from mice.

After the trees are planted rub off most of the sprouts, leaving three or four to grow at will. Prune after the weather becomes cold in the fall, and before spring growth begins. Shorten in and thin out the branches. The following spring cut out again, but don't cut off any of the little side spurs. Make a broad even tree and make it low. Continue the pruning until the tree begins to bear. With only one per cent of the buds left alive after a hard winter's freeze there is a chance for a crop. I have had a great crop with only four per cent.

Peach buds are badly killed in Massachusetts and Connecticut this winter. Out of two thousand buds I found only three alive, but by cutting from spurs I found a better proportion. If trees are badly injured by frost, wait till April, when the buds are swelling, before pruning. Leave the fruit buds wherever they are, one at the base of a branch, one at the top of another branch, etc. This makes a bad looking tree, but gives fruit, and the next year you can prune for form.

After the fruit is set in the spring, look the trees over and thin out the fruit where it is in clusters, leaving it from four to six inches apart. This means sometimes taking off nine-tenths of the fruit, but thinning is absolutely essential to the production of fine fruit. It will take only fifty or sixty of the largest-sized peaches to fill a half-bushel basket, which will sell for two dollars; of the next size, one hundred and twenty-five, selling for a dollar and a quarter; while of the small ones, two hundred will be needed, which will bring fifty cents a basket or a quarter of a cent apiece. Large peaches have more water, small ones more nutritive matter, yet the profit is all in the big ones.

When the fruit is well grown, leave it as long as possible upon the tree. If your market is reached by your own wagon, you can leave it until fully ripe before picking. It will take from seven to twelve days for all the fruit on a tree to come to maturity. Pick the fruit carefully and grade it. Never use a machine in grading. The only machine which can grade peaches well is a bright, intelligent woman. Men will lay aside extra fine specimens to put on top. Women sort them honestly; men either can't or won't. Pack honestly from top to bottom. In my Georgia orchard I have had two

hundred girls employed in sorting fruit. They work hard and get very tired before night, and as an experiment I tried putting a stringed band into the packing shed to play from two o'clock until dark, and found that it increased the work twenty-five per cent, and left the worker in a happy, contented condition.

Will peach growing be overdone? There is a chance that it might be, if all the trees planted came into bearing. But many who try peach growing do not succeed. The man who believes he can do it can. He must believe in himself. He must have a love and a taste for the business and an interest in it.

Massachusetts has some wonderful opportunities in this direction, for in central Hampshire, central and eastern Hampden, central and southern Worcester, Essex, Middlesex, and Norfolk counties, there are many tracts of lands perfectly suited to the peach, both as to soil conditions and elevation. Many of these tracts are within easy driving distance of your manufacturing towns and villages, and all of them are so situated that their choice products in a thoroughly ripe condition can be put down in any of the New England markets in from ten to twenty-four hours after being taken from the tree. It only needs men who have faith in the business and in themselves to develop these grand possibilities.

Discussion.

President Appleton asked if there was not something better than barrels for apples, to which Mr. Hale replied that he believed in boxes. In New York, a few weeks ago, he saw several car-loads of apples wrapped in paper and packed in bushel boxes.

In answer to an inquiry by William C. Strong about peach yellows, Mr. Hale said that quite a number of Massachusetts people do not recognize any such disease. It is a dangerous, deadly disease, for which there is no remedy, no cure. The infested trees should be pulled up immediately and burned. In young orchards it is well to remove the four nearest trees also, in order to prevent the spread of the disease. It is unknown in the South and in California.

Samuel H. Warren asked the lecturer if he knew of anything to protect the buds from winter killing.

Mr. Hale replied that the easiest way was to spray the trees

every very cold spell with water, which would form a coating of ice over the buds and protect them.

Mr. Warren knew of a man who had tried this and saved his orchard.

Jacob W. Manning asked whether Mr. Hale was troubled with peach rosette in Georgia. This, Mr. Hale said, seems to be dying out in the South.

Edmund Hersey knew of a variety which had never been troubled with the yellows. Trees of this variety had been growing on his farm for one hundred and fifty years. Southern trees in his neighbor's orchard had died of the yellows, yet these trees had never suffered. Three strong seedlings were budded with Crawford's Early. These grew and bore peaches for a number of years, but the Crawford part finally had the yellows and the trees were allowed to die. The branches which came from the strong roots were perfectly healthy. The peaches were not of good quality, but it never was a good variety.

George D. Moore asked for information in regard to borers.

Mr. Hale thought banking the trees early in the growing season with six or eight inches of earth the cheapest and easiest way to prevent them. But trees should be looked over once a year and the borers dug out.

In answer to an inquiry by Joshua C. Stone regarding the use of straw or burlaps as protection against freezing, Mr. Warren said that he had had experience in tying trees in burlaps and that it had done no good whatever. He had saved some trees by bending them down and covering them with snow.

Mr. Fisher asked the lecturer how high he allowed his trees to grow.

Mr. Hale replied that they should be headed so low that eighty per cent of the work of thinning, pruning, and gathering may be done on the ground. The average height of a full-grown tree should be about ten feet.

Thomas Harrison asked how to avoid splitting of the trees.

Mr. Hale said by avoiding crotches; cut off one branch. An amateur cultivator might trim trees in ideal form, but it can't be done in a commercial orchard.

Some of the indications of the yellows, Mr. Hale said in answer to an inquiry, are a premature ripening of the fruit, an unnatural size of the fruit early in the season, and a lack of natural flavor.

Also the so-called pennyroyal sprouts, with long, narrow leaves, which develop in the autumn after the leaves begin to fall. The yellows will often strike the most vigorous trees, the first symptom being a thicker clustering of the leaves. Sometimes these leaves, only half an inch apart, will be two inches wide and eight inches long, and on being held to the light will show a yellowish color not seen in the rest of the foliage.

A. M. Clement spoke of the Peach Yellows Law, which he said they have been trying for three years to secure in this State. He is anxious to see it tried as an experiment in the shore counties.

BUSINESS MEETING.

SATURDAY, February 4, 1899.

An adjourned meeting of the Society was holden at 11 o'clock today, the President in the chair.

In the absence of the Secretary, by reason of illness, the President appointed Miss C. M. Endicott Secretary *pro tem.*

Charles E. Richardson presented his Annual Report as Treasurer for the year 1898, approved by the Finance Committee. It was voted that the report be accepted without reading. On motion of William C. Strong it was voted that the Treasurer give a brief abstract of his report, showing the general condition of the financial affairs of the Society.

The Treasurer stated that the Assets were . .		$482,721 65
	Liabilities . .	55,955 43
	Surplus . .	$426,766 22

Since the beginning of the present year the liabilities have been decreased by the payment of the Stickney Fund of $12,000 to Harvard University, agreeably to the terms of the indenture by which it was held. The liabilities have also been decreased by the payment of $1,000 remaining on the mortgage on the building.

The Society has received during the present year the specific bequest of $10,000 by the late Francis B. Hayes, and also a large part of the amount coming to it as residuary legatee under the

same will. The Society has also received $1,000 from Mrs. Jerome Jones to constitute the Henry A. Gane Memorial Fund.

The Treasurer further stated that the present membership of the Society is 738, viz.: 535 Life Members and 203 Annual Members.

Joseph H. Woodford, Chairman of the Committee appointed to prepare a Memorial of the late Charles N. Brackett, presented the following:

By the death of Charles N. Brackett this Society has lost one of its most valued members. When he passed away on the fourth day of January he had attained the age of seventy-two years, and had been an active member of this Society for forty-eight years, and Chairman of the Vegetable Committee thirty-two years. The Society has lost a faithful and unpretending servant, and a man who will be missed by his associates. There are none who over so long a period of time have in quiet faithfulness performed their duties to the Society in a more conscientious or satisfactory manner. He was very punctual, careful, and just in all the work of his Committee; very quiet and unobtrusive in his demeanor, and beloved by all who knew him.

In the death of our fellow-worker and friend, this Committee, representing our Society, desires to express to his family its deep sympathy with them in their and our loss.

JOSEPH H. WOODFORD,
VARNUM FROST,
WARREN H. HEUSTIS, } *Committee.*

The report was accepted, and it was voted that it be entered on the records, and that a copy be sent to the family of the deceased.

J. Woodward Manning moved that the Secretary prepare a card list of all awards of Medals, Certificates of Merit, Honorable Mention, and Complimentary Notices, for the last ten years, the same to be continued and kept on file, experience having proved that there is danger of making such awards a second time, which would be obviated by the existence of such a list.

This motion was carried.

Henry L. Clapp moved that the Society illustrate its TRANSACTIONS and place them on sale.

Edward O. Orpet offered as an amendment that illustrations of plants which had been thought worthy of the award of Medals or Certificates of Merit should be given.

William C. Strong thought that the Society did not want to vote that everything which received one of the above-mentioned awards should be illustrated. William H. Spooner suggested as an amendment that the illustrations should be subject to the approval of the Committee on Publication. The amendments were adopted, and Mr. Clapp's motion, as thus amended, was passed.

The following-named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

Dr. EDWIN A. DANIELS, of Boston.
WARREN D. HINDS, of Townsend.

On recommendation of the Executive Committee, it was voted to appropriate $80 for the use of the Garden Committee for 1898, additional to the appropriation for that year. As, according to the By-Laws, appropriations of money can be made only at Stated Meetings of the Society, this matter will come up for final action at the next Stated Meeting, the first Saturday in April.

Adjourned to Saturday, March 4.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, February 11, 1899.

A meeting for Lecture and Discussion was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

The following lecture was delivered:

INJURIOUS INSECTS AND THEIR TRANSFORMATIONS.

By Prof. CLARENCE M. WEED, New Hampshire College Agricultural Experiment Station, Durham, N.H.

None of the evil effects of the changes which modern civilization has made upon the earth is more evident to the American farmer than the increased difficulty of saving his crops from the ravages of noxious insects and parasitic fungi. Many of us

have heard from our fathers and grandfathers of the apples which once grew in abundance in yards and along highways, strangers alike to the codling moth, maggot, or scab; of the luscious peaches free from worms and rot; the plums unmarked by the curculio, and the pears that had yet to learn the secret of becoming dwarfed, gnarly, and cracked; of the grapes that knew not how to rot; and the potatoes which had neither been blighted nor bitten by the Colorado beetle. Now all is changed: every crop has foes that often gather the lion's share of the harvest. The enemies have come from the north and the south, the east and the west, from Europe and the islands of the sea, and in our own midst they have flocked from the forest to the field, deserting a wild plant for its cultivated congener, or changing their habits to conform to a new environment.

This increase of noxious insects, however, is the natural result of the changed conditions of things. Among the principal factors tending toward it may be mentioned: (1) the massing of crops in limited areas; (2) the facilities for transporting insects long distances by vessels and railways carrying agricultural products; (3) the abandoned farms and orchards that serve as breeding grounds; (4) the destruction of forests and the cultivation of prairies; and (5) the decrease in the numbers of insectivorous birds.

Considering each of these factors briefly, we find that the tendency of the first — that of the massing of crops in limited areas — toward increasing our insect pests rests upon the biological law that the increase of any animal is limited by its food-supply. Under the natural conditions existing on this continent before the advent of the white man, those insects which fed on wild plants had, as a rule, only a limited food-supply. The apple maggot, or railroad worm, for example, is supposed to have bred originally in the wild haws of the woods. The parent flies had then usually to find here and there an isolated tree bearing the fruit in which it deposited its eggs. Its chances of being caught by a bird or entrapped in a spider's web while on this search were very good, so that the scarcity of the food-supply not only directly limited the number of individuals that could be produced, but by being scattered it increased the chances of the adult insects falling a prey to enemies. But in a modern apple orchard all this is changed: the food-supply is almost unlimited, and is so massed together that the insect runs little risk in passing from fruit to fruit, or from

tree to tree. Hence it can multiply indefinitely, unless there is some means of checking it. The same line of reasoning applies to a large proportion of our injurious insects.

We are indebted to our commerce on sea and land for many of the most noxious insects. Brought to our shores from Europe, Asia, or Australia by ships, many of these pests have found a land which for them was flowing with milk and honey, and in which their hereditary enemies had not yet gained a foothold. Consequently they have multiplied without let or hindrance; and by natural and artificial means — notably the railroad trains — they have rapidly overrun the country of their adoption.

The abandoned or neglected fields and orchards all over the United States have proven a prolific breeding ground for many insect pests. Too often the efforts of painstaking farmers have been rendered unavailing by the proximity of such sources of infection. An orchard that has outlived its usefulness had better be converted into firewood than left to die uncared for.

The destruction of forests has compelled certain insects to resort to cultivated crops for subsistence; and in some cases a decided change in feeding habits has resulted. So, also, the bringing of the prairies into cultivation has caused many insects which originally fed upon wild grasses to resort to pastures and meadow lands.

The fact seems well established that birds, as a class, are now less numerous in the United States than they were a century or more ago. While some species have doubtless become more abundant under the changed conditions of modern civilization, others are very much rarer and a few appear to be approaching extinction. It of course was inevitable that the changes produced by man's interference with natural conditions should exert a tremendous influence upon the native fauna: some birds have found the new dispensation better suited to their wants than the old; others have changed their habits and made the best of it; while others have been so relentlessly persecuted that their only hope of survival lay in retreating to inaccessible swamps or cliffs. The wholesale destruction of primeval nesting sites has been a potent factor in the change produced, but fortunately many of the most useful birds have found substitutes that answer the purpose very well: the swallows have gone from hollow trees to the eaves and rafters of barns, and the swifts from trees to chimneys. The

great increase of meadow land has encouraged the development and distribution of birds like the meadow lark, originally confined to the prairies, while the decrease of forests has tended to the suppression of species like the passenger pigeon that lived largely on acorns, beech nuts, and other forest products.

Without stopping for further consideration of the causes of this decrease let us see what effect it seems to have had upon the hordes of noxious insects. It has been repeatedly shown that the birds are one of the most effective natural means of regulating the increase of insects. They have well been likened to a great standing army which of its own volition concentrates itself wherever an insect outbreak is threatened. We are not likely to overestimate the services of these feathered allies. Whenever an investigation of their relations to noxious insects is made we have new proof of their beneficence. Only recently in a study of the food of the chickadee in New Hampshire I was astonished to find that one of these birds frequently devours between four and five hundred plant-lice eggs in a single day, so that during the long winter months which these chickadees spend so cheerfully with us, millions of the eggs of these destructive pests must be devoured. The present crusade in favor of the birds is one in which the horticulturist is vitally interested.

The operation of these various causes, together with the enormous powers of multiplication possessed by the insects themselves, has led to a constantly increasing injury to cultivated crops, until today these tiny foes exact a tribute of ten per cent of the crop products of American agriculture. They form an omnipresent host of tax-gatherers, taking possession of the farmer's crops and enforcing their onerous demands without process of law, unless preventive measures are vigorously prosecuted. They are no respecters of persons; like the rain, they fall upon the fields of both the just and the unjust.

"The authorities best able to judge have estimated the annual loss in the United States due to these little pests at nearly half a billion dollars. Noxious insects, according to Dr. C. V. Riley, recently the distinguished entomologist of our National Department of Agriculture, occasion losses in the United States which are 'in the aggregate enormous, and have been variously estimated at from $300,000,000 to $400,000,000 annually.' In single States and single seasons the loss is often frightful in extent.

During some of the great chinch-bug epidemics the loss in Illinois occasioned by this one insect has amounted to over $73,000,000 a year; and in seasons not marked by an outbreak of such a great crop pest the injury is much more severe than is ordinarily supposed. The official entomologist of the State just named, Prof. S. A. Forbes, after years of careful field observation and statistical study, has recently expressed his belief that 'the insects of the State of Illinois derive as large a profit from the agriculture of this great agricultural State as do the farmers themselves.'"[1]

Fortunately, however, there is an extended silver lining to this dark cloud of insect injury. If these creatures have increased on every hand, our knowledge of methods of controlling them has also augmented with the passing years. Many of the remedies proposed ten or twenty years ago seem now foolish and impracticable. Within the last decade especially the progress has been phenomenal. It has been shown that many insects can be checkmated by a proper crop rotation; that the natural enemies of others can sometimes be used to destroy them; and that others are easily killed by improved insecticides. But the most important advance has been the introduction of the spraying machine, an apparatus by means of which insect-killing substances may be easily and rapidly distributed over the surfaces of trees, shrubs, vines, and herbaceous plants. As I have elsewhere said, its introduction into American horticulture marks an advance almost as important as was marked by the advent of the improved cultivators into our agriculture. Before the latter were introduced the weeds that infest the soil were fought by the hand hoe, but now a single team does the work of many men. In the same way until recently various laborious and partially effective methods were used in fighting noxious insects and destructive fungi; but now many foes of both these classes are fought on a large scale by the force-pump and spray nozzle, and every season adds others to the list of those against which this method may be successfully used. With a large class of farmers and fruit growers, spraying has become a recognized part of the season's operations, and therein lies the chief promise of the method. When the belief becomes general that it is as important to save a crop from destruction by its foes as it is to produce it; that fighting noxious worms must take its

[1] C. M. Weed, "Popular Science Monthly," March, 1893.

place as a farm process by the side of that of fighting noxious weeds; that the parasitic plants which absorb the vitality of leaf and fruit are as dangerous to the crop as the plants which dispute with it the possession of the soil; and when along with this recognition there is placed before the farming community a cheap and wholesale method of preventing the injuries of these organisms — then the vast annual loss now suffered because of insects and fungi will be very greatly lessened.

Transformations. — It is frequently supposed that almost any sort of bug, worm, or spider that flies or crawls about is an insect, but strictly speaking, a large proportion of these creatures are not insects at all. For example, a spider is not an insect; neither are the thousand-legged worms so often found under boards. In both these cases the creatures have too many legs to belong to the insect class. Spiders have eight legs and the thousand legs a great many more, while the true insects have but six. The body of an insect is also divided into three principal regions — head, thorax, and abdomen. A majority of them are also characterized by undergoing during their development a series of well-marked changes or transformations. Such insects exist in four distinct stages; namely, 1, the egg; 2, the larva or caterpillar; 3, the pupa or chrysalis; 4, the adult or imago. We may take, for example, the common cabbage worm: the white butterfly deposits, singly or in clusters of two or three each, small yellowish eggs upon the cabbage leaf. These soon hatch into little green larvæ that feed upon the substance of the foliage; in about two weeks they become full grown, when they generally leave the cabbage plant, and, finding some suitable shelter, — beneath a board or under the coping of a fence — change to chrysalids. They remain in this condition about ten days, when they emerge as butterflies.

An insect which goes through so distinct a series of changes as this is said to have complete transformations, to distinguish it from those having incomplete transformations. For example, our common grasshoppers hatch in spring from eggs deposited in the ground the previous season. The newly hatched grasshoppers resemble the adults in general appearance, but are smaller, and have no wings. They gradually increase in size, and moult, or shed their skins, at frequent intervals. They continue active until they become full grown, having no quiet pupa or chrysalis state. Such insects are said to undergo incomplete transformations.

While, in general, insect transformations may be grouped under these two headings, complete and incomplete, there are many modifications of each of the methods. One of the most interesting of these is illustrated by the aphides or plant lice — the green flies of the gardener and florist. The life-history of these little creatures may be summarized as follows: In the spring there hatches from an egg deposited the autumn previous a little aphid that sucks the sap of the food plant for a number of days — sometimes a fortnight — before it becomes full grown. During this period of growth it moults, or sheds its skin, a number of times to provide for its rapidly increasing size. This insect is sometimes called the stem-mother: she is always wingless. Soon after reaching maturity she commences to give birth to living young, continuing the process usually for several days. The young mature in the course of ten days or two weeks, when they begin to give birth to a third generation, and so the process is repeated again and again, the insects multiplying with marvellous rapidity. All of these aphides are the so-called agamic or viviparous females, giving birth to living young without the presence of any males. Throughout summer this is the only method of reproduction, but on the approach of cold weather a true sexual generation is produced. Eggs are laid by these, being deposited on the twigs of trees or the leaves of herbaceous plants, where they remain throughout the winter.

Insects take their food in two ways: some insects bite, others suck. The former, of which the Colorado Potato Beetle is an example, are provided with jaws by which they can gnaw the surface of the food-plant. The latter have, instead, a pointed, tube-like beak which they can insert into the tissues of their host-plant, and suck out the sap.

On account of this difference in feeding habits some insects can be destroyed by coating their food-plants with poison, the beetle just mentioned, for example, while others, like the plant lice or the Chinch Bug, must be treated with some insecticide that kills by contact.

Injurious insects have many natural enemies to contend with. Among the larger animals, they are preyed upon by the "fowl of the air and the fish of the sea;" frogs lick them up with their viscid tongues, and toads are continually sending them in search of the mystic jewel within their bodies; while snakes, lizards,

moles, skunks, and a host of other animals are their constant enemies. But more destructive than any or all of these are the foes of their own class — the predaceous and parasitic insects.

Predaceous insects are those which attack other insects from the outside, devouring them bodily or sucking out their lifeblood. The handsome little lady-bird beetles, the two-winged robber-flies, or the four-winged dragon-flies furnish good examples of this class. So, also, do the black ground beetles, found everywhere under sticks and stones. Some of the largest of these are called caterpillar hunters, because they feed upon canker-worms, army-worms, cut-worms, and various other insect pests. Other predaceous insects live in ponds, lakes, and rivers, devouring mosquitoes and related creatures, while still others burrow through the earth, and devour the insects found therein.

The common dragon-flies or devil's needles are good examples of predaceous insects. The adult dragon-flies lay eggs upon the stems of plants growing in ponds and streams. The eggs soon hatch into small larvæ that live in the water upon young mosquitoes and other aquatic insects. In about a year the larva becomes full grown; it then crawls up out through the water, the skin splits open along the back and the adult dragon-fly appears. It rests awhile to expand its wings and then flies rapidly through the air, in search of winged insects of almost any sort. In "The Two Voices" Tennyson has described the final development thus:

"To-day I saw the dragon-fly
Come from the wells where he did lie.

"An inner impulse rent the veil
Of his old husk: from head to tail
Came out clear plates of sapphire mail.

"He dried his wings: like gauze they grew:
Thro' crofts and pastures wet with dew,
A living flash of light he flew."

Parasitic insects differ from their predaceous cousins in that they develop within the bodies of their victims and thus destroy them. These, also, are exceedingly numerous, both in individuals and species. A good illustration of the habits of this class is found in the small, four-winged black fly that destroys the common Grape Caterpillar, an insect closely related to the

familiar Tomato Worm or Tobacco Worm. This fly deposits a number of eggs beneath the skin of the caterpillar, and these eggs soon hatch into minute worms or maggots that absorb the body juices of the worm and develop at his expense. After a few weeks these maggots become full grown, and burrow their way out through the skin of their hapless and helpless host. They then spin their white and silken cocoons upon his back. Within these cocoons they change to the pupa or chrysalis state. About two weeks later they again change, and the legless little maggots find themselves transformed into neat and pretty black flies, with four wings and six legs, like the one which a few weeks before deposited in the caterpillar the eggs from which they developed.

But these parasites are not always so successful as this, for they frequently furnish a striking illustration of Dean Swift's oft-quoted couplet:

> "So, Naturalists observe, a flea
> Has other fleas that on him prey;
> And these have smaller still to bite 'em;
> And so proceed ad infinitum."

These parasites are frequently subject to the attack of a still smaller parasite which destroys them as they destroyed their host. In such cases the first-mentioned species is called the primary parasite and the other a secondary parasite.

It is the presence of these secondary and other parasites that makes the subject of injurious insects and their enemies extremely complicated. For example, in New Hampshire we have been studying for several years the life-history and enemies of the common American tent caterpillar — the pest which for so many seasons has pitched its unsightly tents in the orchards and along the highways of New England. Doubtless to most of you the general life-history of this insect is well known. You know that in winter it exists in the egg state — the masses of a hundred or more being fastened around the twigs of apple and wild cherry trees. In the spring the little caterpillars emerge from the eggs and begin feeding upon the tender foliage of the buds about them. In a few days they begin to make a silken tent, utilizing generally, for this purpose, a fork of the branch. As time goes on the nest is enlarged. The caterpillars retire to the tent at night, and during cold and wet weather, and when not feeding. They have

regular times for meals, leaving and returning to the nest in processions. They become full grown in about six weeks, being extremely voracious during the latter part of their development. They are nearly two inches long, with a hairy body ornamented with a distinct white stripe along the middle of the back, on each side of which are numerous short, yellow, longitudinal lines, rather irregularly arranged.

Most of the caterpillars leave the tree where their nest is as fast as they are full grown, and crawl about in search of a suitable shelter to pupate in. Having found this, — beneath a board or in the cracks of a fence, — they spin an oval, silken cocoon, yellow when completed, within which they change to the pupa or chrysalis state. In two or three weeks another change takes place, and from the cocoons come forth reddish-brown moths. The female moths soon deposit the clusters of eggs on the twigs of trees, after doing which they die. Thus there is but one brood each season.

Now we have bred more than twenty species of parasites which prey directly or indirectly upon this tent caterpillar. One of these is so tiny that its development takes place within the egg, and so it is called an egg parasite. Most of the others prey upon the caterpillars themselves. Perhaps the commonest species is a four-winged fly belonging to the genus Pimpla that deposits its eggs in the caterpillars when they are nearly full grown. These eggs hatch into little grubs, each of which absorbs the juices of the host, developing at its expense, but not killing it until after it has spun its cocoon. Then the parasite matures rapidly, changes to a pupa, and soon after emerges as a four-winged fly.

This parasite, however, is commonly checked in its career by another. A four-winged fly of a different species from the one which laid the egg for the primary parasite lays an egg beside or upon the parasite grub. This egg hatches into a tiny larva that attaches itself to parasite No. 1, and begins slowly to absorb its lifeblood. Parasite No. 1 is unable to shake off parasite No. 2 and soon gives up his life to it. No. 2 feasts upon the carcass of its victim and rapidly becomes full grown, when it changes to a pupa, to change again soon after into a fly.

But a third fly, called Dibrachys, often comes upon the tragic scene. When the larva of parasite No. 2 is approaching full growth the Dibrachys fly deposits beside or upon it an egg. The

egg soon hatches into a minute larva that fastens itself to parasite No. 2, and soon kills it. Then this parasite No. 3 feeds upon the body of No. 2, as No. 2 had fed upon No. 1, and No. 1 had fed upon the tent caterpillar. In due time No. 3 becomes full grown, changes to a fly, and wanders off in search of other victims.

These shifting scenes of tragedy have all taken place within the small yellow cocoon of the caterpillar. The cocoon, perchance, is fastened to the tough bark of a tree or the boards of a fence. Along comes a bird, — a chickadee or a sparrow, — spies the yellow silk, and, knowing that there is a luscious insect morsel inside, pecks open the cocoon and devours the contents. Now from our human point of view, of which, of course, none of these creatures is conscious, does the bird do us a benefit or an injury? It may be that the bird simply eats a caterpillar that had no parasite, in which case we should conclude that it was befriending us; it may be that it ate instead parasite No. 1, cutting off the hope of progeny of a host of friendly insects, in which case we should be likely to conclude that it was doing us an injury; possibly the bird comes when parasite No. 2 is getting in its work, when again we should conclude that it was a friend; or finally should it reach the cocoon when parasite No. 3 was present the same reasoning would lead to the conclusion that again the act was unfriendly. But the arrangements by which the increase and decrease of injurious insects are brought about are so intricate that after fifteen years' consideration of the subject I am convinced that we cannot safely say that the bird which devours the secondary parasite of a noxious insect is doing an unfriendly act. What we call the "Balance of Nature" is so delicately adjusted that the only safe thing for man to do is to act cautiously and with the fullest possible knowledge.

Now this sketch of the parasites which beset the tent caterpillar is no fanciful one. And could we but study with equal thoroughness our other injurious insects I doubt not that similar conditions would be found. In fact, in several cases such studies have been made, and very similar results obtained.

Insect enemies and birds, however, are only a part of the agencies which work for the woe of the tent caterpillars. During the summer of 1897 in southern New Hampshire these various parasites were so abundant that a large percentage of the caterpillars were destroyed before maturing into moths, yet enough of the latter developed to provide eggs for a vast number of colonies for the

brood of 1898. But during 1898 in my region the pests were checked much more effectively, and by entirely different agencies. Just after the larvæ had hatched last April a heavy and long-continued rainfall caused the death of enormous numbers of them. An examination of the apple and wild cherry trees after the storm showed that in most cases the only larvæ present were those huddled together on the lower side of the egg mass, where they were protected from the washing effect of the rain. These survivors developed in sufficient numbers to be decidedly in evidence in May, but they had to succumb to a very great extent during the last weeks of their growth to a bacterial disease — a sort of insect cholera — that killed them in vast numbers. The effectiveness of this disease was doubtless increased by the wet weather prevailing at that time. Early in June nearly every nest was full of dead and dying caterpillars, many of those on the outside of the web gradually shrivelling up until only the dried skins remained. A series of observations made upon a large number of nests just before the time for pupation showed that more than ninety per cent had been killed by this disease. As a result there were few of the caterpillars crawling about the streets and highways in early June, although during previous years great numbers were to be seen at that time. There were also comparatively few moths later in the season, and the eggs now to be found are correspondingly reduced.

But what was the effect of this epidemic of disease upon the parasite? It was almost as destructive to them as to the caterpillars. While some of the parasitic flies probably found other species in which to deposit their eggs, it seems to have been inevitable that vast numbers of them must have perished with their hosts. In consequence it seems likely that in the region under my observation the outbreak of the American tent caterpillar which has extended over at least the last five years has been checked, and that the coming season the pests, having swung to a point in which their numbers are far below the average, will begin again the gradual increase that shall lead to another culmination some years hence. And it is worthy of note that they begin this increase at a time when their parasites are, comparatively speaking, very scarce, so that for several years the caterpillars will suffer little from their attacks.

I have dwelt thus upon the relation of the tent caterpillar to its parasites because there is an impression abroad that the modern

way of fighting noxious insects is by means of their insect enemies. The famous lady bird introduced into California a few years ago to destroy a scale insect is responsible for much of this opinion. But this remarkable case was the exception which proves the rule, that in general it is not practicable to fight injurious insects by means of enemies of their own class. In the California case the conditions were unique, and a great deal too much weight has been given to it.

It is fortunate that this American tent caterpillar is restricted in its food to comparatively a few kinds of trees. Were it a more general feeder these periodical outbreaks would be matters of much more serious concern than they now are. An illustration of this fact is seen in the history of the closely related Forest Tent Caterpillar (*Clisiocampa disstria*), which feeds upon a much greater variety of fruit and shade trees. In its life-history it is very similar to the common species; it is a native American insect and is beset by hosts of enemies, yet during the last century there have been frequent and destructive outbreaks of it in many parts of the United States. In Maine, New Hampshire, and Vermont during the last few years such an outbreak has been taking place. Last season immense damage was done over large areas of forest growth, the woods in July looking as bare of foliage as they do now. There are millions of eggs now upon the trees, with every prospect that the coming season the attack will reach a severity much greater than that of 1898. Before such hordes of caterpillars the efforts of individual men seem futile. It is possible to fight insects in orchard trees and on the home grounds, but when the wilderness is alive with crawling foes what can man do but hope for a speedy culmination of the outbreak? But we know from long experience, not only with this but with many other insects, that the outbreak will be ended by natural causes only after the passing of several seasons in which great damage has been done.

This Forest Tent Caterpillar perhaps better than any other illustrates what would happen if the people of Massachusetts should permit the Gypsy Moth to escape from its present boundaries and become a scourge to the agriculture of the United States. This forest caterpillar is a native insect; for untold ages other American insects have been learning to prey upon it, but notwithstanding this the caterpillar at frequent intervals becomes so abundant as to do immense damage over large areas. There is

every reason to believe that the gypsy caterpillar, even if we imported every species of parasite to be found upon it in Europe, would be vastly more destructive. Its range of food-plants is much greater, especially so in its habit of attacking coniferous trees; it is a hardier species; it is not so freely eaten by birds; and it has that peculiar but undoubted advantage which the alien insect, sparrow, or rabbit enjoys over the native inhabitant. The argument so often heard that the gypsy moth can safely be left to the mercy of its parasites is discredited by the experience of every economic entomologist in the land. Any one who believes the argument to be sound would do well to visit, next June, the regions infested by this forest caterpillar.

The methods of preventing insect injuries may be conveniently grouped together under four headings; namely, 1. Agricultural methods; 2. Mechanical methods; 3. Use of natural enemies; 4. Insecticidal methods.

The limitations of the use of natural enemies have already been discussed, and there is only time now for a brief mention of the more important measures under the first and second of these headings.

[The speaker here gave a short discussion of clean culture, crop rotation, fall ploughing, fallowing, fertilizing, modifying the time of planting, hand-picking, excluding by mechanical means, attracting to light, and various other measures.]

Lack of time forbids a discussion of the various insecticidal methods of destroying injurious insects. I have already said that the most important recent advance in these methods has been the introduction of the spraying machine, and I would now add that the most important advance in the use of spraying machinery has been made by the Gypsy Moth Commission here in Massachusetts, in perfecting both the material to apply and the machinery with which to apply it.

Spraying is simply an easy and practical method of distributing certain substances having a destructive effect upon insect and fungous life over the outer surfaces of trees, shrubs, vines, and herbaceous plants. These substances are usually applied in a finely powdered condition, and the tiny particles stand guard over the plants, killing with remorseless certainty any insect or fungous pest that attempts to pass through their lines to reach the plant. As a rule the particles themselves do not enter the plant, but re-

main on the outside until driven off by the combined action of wind, rain, dew, and sunshine. This is not true, however, of the contact-killing insecticides, which are applied directly to the offending insects, and do not remain on the plant in an effective condition.

In conclusion, let me say that in view of the progress made in the past twenty-five years in our knowledge of injurious insects and the methods of preventing their injuries, we may well be sanguine concerning the future. But the experience of the present decade has shown us as never before that these pests must be reckoned with in the plans of the individual, the State, and the Nation. There are hosts of foes that have not yet invaded our country which we are likely to be called upon to fight, unless rigid measures of exclusion are put in force. It behooves every man interested in horticulture to be on the lookout for insects new and strange, especially on plants from abroad, and to take no chance that can be avoided of introducing one of these insidious foes.

Discussion.

Benjamin P. Ware spoke of the lecture as intensely interesting and instructive, and said that we have learned many ways of protecting ourselves. He had on his land a waste place covered with choke-cherry trees, which had been infested with the tent caterpillar, and he had felt obliged to go over the trees and destroy them. This, he said, is a very simple matter. When they are first hatched go out in the morning when the sun is shining and you can see them all, and easily destroy them. Mr. Ware appealed to the ladies not to wear birds on their bonnets. Birds, he said, are growing scarcer and scarcer. A single dealer in one year imported forty thousand humming birds to decorate bonnets. He presented spraying as the great remedy for injurious insects. The idea of spraying, he said, originated in Essex County; it was first discussed at a Farmers' Institute in Topsfield, and afterwards at a meeting of this Society. Mr. Ware moved that a vote of thanks be presented to the lecturer.

Professor Weed knew of another way in which caterpillars had been exterminated. In a town in New Hampshire the Village Improvement Society offered the children ten cents a hundred for destroying the caterpillar egg-masses. Eight dollars and twenty-

five cents in all was spent, one boy receiving $2. Thousands and thousands were destroyed in this way, and the town was practically freed from them.

Varnum Frost asked the lecturer whether he thought there was any occasion for alarm at present concerning injurious insects. He thought the tent caterpillars need cause no anxiety, for they are so easy to destroy. A weak solution of Paris green — one pound to two hundred gallons of water — will clean them all off.

Professor Weed considered spraying the most effective way of killing them. Caterpillars do not commit suicide; they are sometimes destroyed by a bacterial disease, but usually not until after a great deal of damage has been done. The idea that their natural enemies will destroy them before much mischief is done is wrong. There is an outbreak of the army worm about every ten years. The chinch bug appears about every thirteen years, and is liable to disappear suddenly.

Mr. Frost had had experience with the tent caterpillar for sixty years, and had twice known it to become so numerous that farmers got discouraged and gave up trying to exterminate it. It had appeared in such vast numbers that all foliage was soon devoured, and, its food being gone, it actually starved. He believed that the canker worm would exterminate itself, and that the gypsy moth would do the same.

Hon. Aaron Low had also twice during his life noticed that the tent caterpillar will, when it becomes very numerous, actually starve. He had a field of oats attacked by army worms, which soon became so numerous that he could hear them eating in the night. Trenches were ploughed and ditches dug across the fields, and here he could have gathered bushels of the worms. He afterwards had a good crop of Hungarian grass where the army worm had been so destructive. At the first appearance of the worm the grass was mowed, but before he could get it into the barn it was eaten to shreds. He had supposed they would come again the next year, but had seen none since.

A gentleman who was a member of the Newton Improvement Society thought it was useless to have the school children destroy the caterpillar nests. After they had destroyed many thousands, enough were left to do damage. Then, when the caterpillar had disappeared, the credit was given to destroying the nests, but not one in ten was destroyed.

Thomas Harrison said that a year ago two of his neighbors had sowed barley for green crops. When two or three feet high it was attacked by the army worm. This year they changed the crop to corn and rye, and the army worm had not shown itself. Sometimes a change of crops brings the army worm with it.

In answer to an inquiry Professor Weed said that the worm could not possibly be in the seed. It will develop in grass land, and when grown will seek grain fields, even crossing a road to get food that it likes.

The vote of thanks to the lecturer was unanimously passed.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, February 18, 1899.

A meeting for Lecture and Discussion was holden at eleven o'clock today, the President, FRANCIS H. APPLETON, in the chair.

The following lecture was delivered:

WHY CROPS MUST HAVE NITROGEN AND HOW IT CAN BE PROVIDED.

By Prof. G. C. CALDWELL, Cornell University, Ithaca, N.Y.

That all vegetation must have available nitrogen food is an established fact. The plant cannot grow without nitrogen. Again and again has the experiment been tried of planting the seed in an artificially prepared soil, usually clean sand, to which all the necessary foods of the plant were added except the nitrogen; every one of these experiments has given the same result: the seedling has grown for a short time only, while making use of the small quantity of nitrogen in chemical combination in the seed, — such nitrogen compounds as are stored up in every seed for the nourishment of the young plantlet till its roots can take food from the soil.

It is not long before the little plant begins to show most plainly that there is something seriously wrong in the soil; the lower and older leaves take on a yellowish color; a few new leaves may appear higher up on the stalk, that draw a part of their food from the older leaves; but they are miserably poor leaves at the best,

and they soon stop growing. It is in this way that the plant informs us that it is suffering from nitrogen hunger. This result never fails to appear, sooner or later, no matter what kind of a plant is put to the test. Such is the simple proof that nitrogen in the form of some chemical compound is an absolutely necessary component of the food of plants.

As to the use that is made of this nitrogen. We know only that it is worked up somewhere in the cells of the plant into chemical compounds that are exceedingly complex in their composition, and which play a very important part in the production of the substance of the plant, and therefore in its growth. The white of the egg, so familiar to everybody, is just such a kind of a compound as are those that are made in the plant cells, and for the making of which the nitrogen, as well as other foods, is absolutely necessary. The white of the egg is called albumen; these other compounds of the same kind that are made by the plant are called albuminoids, because they are like the albumen.

According to the opinion of chemists, these albuminoids are very closely connected with the power of motion in living beings. Animals have the power of motion, while plants have such power only in comparatively few cases. The bodies of animals are made almost entirely of albuminoids; plants, on the other hand, contain very much less; hence it is inferred that a large proportion of albuminoids in the living being goes with the power of motion which that being possesses.

But even though a plant cannot as a general rule move any of its parts, yet there is a kind of motion that goes on *in* the plant which seems to support this idea that power of motion is dependent on the coöperation of albuminoids. This motion is seen in the contents of the cells of the young and active leaves. These cells contain, first of all, water; in this water is a yellowish, semi-fluid substance which has about the consistency of the mucilage that we use for sticking things together; this part of the cell-contents is called the protoplasm; it consists largely of albuminoids; in it the microscope reveals the presence of a multitude of minute grains. In young cells the protoplasm is in constant motion, and the exceedingly small grains are themselves moving in currents through the protoplasm. Here, then, we have motion; motion in a substance rich in albuminoids; and this motion is in some way closely associated with the life of these cells.

The crops must, therefore, have nitrogen food in order that albuminoids may be produced; they must have albuminoids in order that they may grow; and these albuminoids must be in the young, active cells in abundance, in order that the growth shall be vigorous and healthy, and that the crops shall be large and profitable. We must raise crops that have albuminoids in order that our cattle and we ourselves can live. The animal cannot make albuminoids; it must get its whole supply from the grass, hay, grain, etc., that it eats, or by chewing up some other animal which got its nitrogen from the plants that it ate. We human beings are just as dependent on plants for our albuminoids as is the lowest grade of an animal; we can make thousands of chemical compounds in our laboratories, but we cannot make the minutest particle of an albuminoid.

The leaves with their millions of microscopic cells are the laboratories in which the albuminoids are made, out of carbon from the carbonic acid that is in the air, with the hydrogen and oxygen from the water that the plant is always taking up from the soil, the sulphur, perhaps, from some plaster that may be in the soil, and, finally, the nitrogen which it usually finds in the fertilizers that we apply.

A part if not all of the process of making plant substance requires the coöperation of the sun's rays. With plenty of food and sunlight and water provided, business is brisk on every bright, warm day, in these myriads of laboratories; sugar, starch, and such like things are made first, and then the albuminoids. Very little do we realize the magnitude of the work that is being carried on all around us, as we follow our cultivators through our corn or garden truck, or as we look over our fields of grain and smile at the prospect of thirty bushels of wheat or fifty bushels of oats, or as we sniff the fragrance of eight hundred bushels of onions per acre. We may say to ourselves that it is all the result of *our* labor; but the sun, the air, the soil, and the leaves are doing the biggest part of the work by far.

The possible and available sources of nitrogen are, first and foremost, the soil; second, the manures and fertilizers upon which we place so much dependence; and third, the air. As to the first source, few persons know how much nitrogen in chemical combination is contained in every soil of fair quality; the stock is immense in some cases. Lawes and Gilbert, of England, found in

the arable soils of their own fields from 3,255 to 8,645 pounds of nitrogen per acre in the uppermost two or three feet, and therefore within reach of the plant; in various other soils of Great Britain from 3,500 to 7,700 pounds per acre of area; in the prairie soils of the United States from 6,650 to 21,700 pounds; in the soils of the Manitoba prairies 16,000 to 42,000 pounds within a depth of four feet; in the soil of an English pasture 10,000 to 11,000 pounds.

Let us compare these great stores of nitrogen, quantities so large that they can be measured by tons as well as by pounds, with the quantities that are carried from our soils in the crops. The figures are, for an acre of wheat 48 pounds; 121 pounds in a good crop of corn including the stalks; 47 pounds in a fair crop of potatoes; 130 pounds in a crop of beets; 49 pounds in a crop of hay. It would seem that we need not concern ourselves about the supply of nitrogen food for our crops, with so much already in the soil, and so little carried off each year. Yet we do know that we must concern ourselves about this matter; we do know that if we let the nitrogen in the manure piles go to waste, or if we leave out the nitrogen in the fertilizers that we buy, our farming operations will not be profitable.

If it be asked why all this nitrogen in the soil seems to be of so small account, the answer is that it is in compounds that are not easily dissolved by the water in the soil, and very slowly becomes available for plant food; only as the nitrogen passes into other combinations that are soluble in water, or in the sap in the roots of the plants, can the plants get any good out of it. If one can establish a good system of drainage of the soil, and can till it frequently during the growing season, thus conserving the moisture and keeping the ground porous, so that the air can have free admission, good crops can be obtained for a series of years without putting any nitrogen fertilizer on the soil. The effect of such treatment is at least in part to convert some of the unavailable because insoluble nitrogen compounds into available because soluble compounds.

It was by this kind of treatment, and this alone, no fertilizer being applied, that an English farmer some years ago cropped a piece of ground with wheat for twelve years, getting on plots of half an acre as much wheat as was harvested from a whole acre of good soil treated in the ordinary way by good farmers. It was by a similar course of treatment of the soil that Professor

Roberts at Cornell obtained two successive crops of potatoes, yielding in the first year 367 bushels and in the second year on another plat 343 bushels; the soil was only a fair one at the start, and it received no fertilizers at the beginning of the experiment.

Nitrogen in purchased fertilizers costs nearly three times as much as phosphoric acid, if it is bought in that compound which is in general the best nitrogen food, namely, nitrate of soda. For intensive agriculture or horticulture the home supply of nitrogen in the manure of the yard is usually insufficient, and the supply must be increased in some way. The frequent tillage of the soil many times during the growing season may not be practicable as a general thing, no matter how much may be gained by it.

Is there, then, any other way by which we can get a sufficient supply of nitrogen in an available condition at less cost than by buying nitrate of soda, or with less labor than is involved in the tillage method? That our leguminous crops, such as clover, peas, beans, vetch, lucerne, and lupine may be used to help us is undoubtedly known to many in my audience, if not to all. I trust, however, that I may be able, while calling to mind again much that you have already heard and read about this subject, to give you some new information, and by means of the illustrations that will be shown with the lantern to make a more lasting impression than I can by merely talking to you about it.

It was first observed as far back as 1615 that there are peculiar swellings on the roots of certain kinds of plants; little attention was paid to them; they were supposed by some to be simply parasites living on the juices of the plants on which they were growing; others supposed them to be the results of the attacks of some insects; and others still thought that they might be the beginning of new roots. Not till 1858 was any further attention paid to them; then a German botanist found that they contained bacteria or microbes — those smallest of living microscopic organisms; he suggested the possibility that these swellings, or tubercles as they are more commonly called, stand in such relations to the plant on whose roots they are established, and especially to leguminous plants, as to account for the common opinion of farmers that such plants can take up and assimilate the free, uncombined nitrogen of the air.

In 1887 two German agricultural chemists performed some very interesting experiments which showed most conclusively that these

tubercles really do in some way enable the plants bearing them to take nitrogen from the air and make use of it as they would nitrogen from any other source. In 178 pots they put soil consisting of pure sand with no nitrogen in it, but to which all other foods that the plant required were added; there were planted in these pots oats, buckwheat, rape, — a plant then much cultivated in Germany for its oil, — peas, seradella, — a forage crop, — and lupine; only one seed was planted in each pot. The seeds germinated in all the pots alike, and all the plants grew alike up to a certain point, or as far as they could grow with the aid of the nitrogen in the seed; then the growth stopped in all the pots, and soon the yellowish color indicating nitrogen hunger appeared. An extract of garden soil was then made by simply stirring it up with water, and letting the coarser particles settle to the bottom of the vessel; a very small quantity of this extract was then added to the soil of each of the pots.

The oats, buckwheat, and rape remained in the same state of nitrogen hunger, making no further growth. The peas, seradella, and lupine, after a little time, as if waiting to consider the matter, suddenly recovered their normal green color, and from that time on continued to grow luxuriantly till they were ripe. If some of the extract was first boiled before applying it to the soil, all the plants so treated remained in the condition of nitrogen hunger, whether they were leguminous plants or not. The boiling of the extract could produce no other important change in the liquid than to kill bacteria in it. It therefore appears to be proved, even by these first experiments, that living bacteria brought about this change in the condition of the leguminous plants, and at the same time that they were quite unable to help the other plants that were not legumes.

On pulling the plants out of the soil when their growth was ended, it was found that all the leguminous plants had tubercles on their roots, while there were none on the plants that were not leguminous. Thus it is shown that the tubercles, or the bacteria in them, produced the sudden change in all the plants of one kind, the legumes; and it is indicated that, while these plants were waiting during that brief time after the soil-extract was added before taking on the dark green color and beginning to grow again, they were simply waiting for the tubercles to be formed and ripened for their use.

One remarkable feature of this series of experiments was that all the plants of the same kind told the same story. Not a single oat, rape, or buckwheat plant revived and resumed its growth; on the other hand not a single pea, seradella, or lupine plant failed to respond to the inoculation, as it is called, of the soil with the bacteria; all that they needed was the help of these microscopic living things; then with the abundance of all other necessary foods that were mixed with the sand at the beginning of the experiment they were fully equipped for rapid and vigorous growth.

In another experiment some sand was first heated to redness in order to drive out all the nitrogen in it and to kill any bacteria that might be there; this sterilized sand was then mixed with the needful quantity of all the plant foods except the nitrogen, and some of the extract of garden soil was also added; one grain of buckwheat, one of oats, and one pea were planted in this sand all in one pot; water was added, and the pot under a glass shade was then put where the sun would shine on it during the day. The result was the same as before: neither the buckwheat nor the oat seedling recovered from the nitrogen hunger; but the pea grew luxuriantly and was happy as it towered above its starved companions; even though the roots of the pea were probably intertwined with those of the other plants, and the roots of the latter were perhaps in contact with some of the tubercles of the pea roots, still these plants could make no further growth.

Another experiment was tried with thirty pea plants, each one in a pot by itself; the soil was prepared in the same manner as in the other experiments except that the extract of soil was added to ten of the pots only. All the plants grew to the height of about four inches, and then the growth stopped in every pot; after a little time the plants that had been inoculated with the soil extract suddenly took on the usual color of healthy plants, and went on growing. All these plants had an abundance of tubercles on their roots; the other plants had no tubercles.

Of course this discovery excited a great deal of interest throughout the agricultural world. Other investigators repeated the experiments for themselves, and obtained the same results. Among these were Lawes and Gilbert, of England, who have been carrying experiments along agricultural lines for sixty years, and have done an immense amount of work for the advancement of agriculture;

they were fully convinced by the results of their own experiments that the discovery of the Germans was correct.

That the nitrogen is really taken from the free nitrogen of the air by the leguminous plants has been conclusively proved by another experiment. Legumes with tubercles on their roots have been grown in pots in a closed glass case, so tightly constructed that no air could pass in or out. The air in the case was analyzed before and after the experiment, and it was found that some of the nitrogen was missing; and this could be explained only by supposing that the plants growing in the case, or the bacteria in their roots, consumed it.

There are a great many kinds of bacteria in the world; and there seems to be a number of different kinds of bacteria that bring about this fixation, in the plant, of the nitrogen from the air, each kind doing its best work for that species of a legume from which it was taken, and in a few cases doing as good work for other species. In other cases certain kinds of legumes get very little help from bacteria taken from another kind. This means that if you want to raise a good crop of peas with the aid of tubercles on the roots you will be most successful if you inoculate with soil in which peas have been growing, and in which there are pea bacteria; and that if you inoculate with some soil where there has been a growth of locusts or lupine, and where the bacteria are what we might call the locust variety or the lupine variety, your peas will not turn out so well. The pea and the vetch are less particular than other plants about the source of the bacteria with which they are inoculated; lupine, on the contrary, is exceedingly particular in this respect, and will make hardly any growth at all if inoculated with bacteria from any other species of legumes; but give it bacteria from a soil in which lupine has grown, and also an abundance of potash and phosphoric acid and lime, and it will do wonders. The yellow lupine is considered in Europe as the best plant to be used for the improvement of poor, sandy soils; it will grow freely where other legumes will nearly starve for want of nitrogen even if properly inoculated.

The quantity of nitrogen that can be taken from the air by some of these plants under favorable conditions is sometimes enormous. In the case of the first series of experiments that I described, the amount of nitrogen that some of the plants contained and which

they had taken from the air was determined by analysis; one of them contained 20 grains of nitrogen. The quantity seems small, but when we consider how much would be gained by all the plants that could grow on an acre of soil the result is very large. Each of those 178 pots contained 9 pounds of soil; the weight of the soil of an acre of ground to the depth of 12 inches is about 3,500,000 pounds; 9 will go in 3,500,000 about 400,000 times; we might have then 400,000 pea plants on one acre; this number of plants would take from the air 115 pounds of nitrogen, provided that every plant grew as vigorously as those in the pots. If this number of pounds of nitrogen be multiplied by six the product will be very near the weight of nitrate of soda that one would have to buy in order to get 115 pounds of nitrogen, or nearly 700 pounds. No one who has used this fertilizer, and knows how to use it, would dare to put 700 pounds on an acre; he would know that such a dose would do serious damage to the crop; a third as much would be the most that he would care to apply. Some remarkable and almost incredible results were obtained by a French chemist of great renown. In six trials with vetch, growing eleven weeks, there was gained from the air a quantity of nitrogen equal to from 1,285 to 1,728 pounds of nitrate of soda calculated per acre. Clover growing ten to twelve weeks gained in six experiments nitrogen equivalent to from 412 to 1,150 pounds of nitrate of soda. With lucerne, vetch, and some other leguminous plants growing together the gain in nitrogen was equivalent to from 728 to 3,717 pounds of nitrate. With lucerne alone, growing from eighteen to twenty-one weeks, the gain of nitrogen was equivalent to from 2,471 to 3,885 pounds of nitrate. The meaning of these figures is that these several crops, supposing each one to be growing on an acre of soil for periods ranging from ten to twenty-one weeks, would gain from the air quantities of nitrogen which if bought in the form of nitrate of soda would require from 412 to 3,885 pounds of this fertilizer; the first figure was the lowest result, with clover; the second was the highest result, with lucerne.

The potted soils in which these plants grew were carefully seeded or inoculated with the tubercle bacteria by means of extracts of other soils in which the same kinds of plants had been grown; the soil itself was well fertilized with all the foods needed by the plants except the nitrogen; the plants were kept supplied with the right

amount of water, so there was never any suffering from drought. Of course in the open field, where the supply of water is variable, and occasional droughts are unavoidable, there would be less vigorous growth, and consequently less nitrogen would be drawn from the air. But nevertheless these figures given above do at least prove that there are great possibilities in this natural method of getting nitrogen in the combined state from the inexhaustible supply of free nitrogen in the air. This combined nitrogen can be made useful for other crops that *must* get their nitrogen from compounds of nitrogen in the soil, either by using the nitrogen-gathering crops for fodder and spreading the manure in the fields, or by ploughing the crop in; it has been shown by experiments that the nitrogen of a crop used for green manuring is quite as available as the nitrogen in stable manure, or even more so.

Since we now know that clover can gain nitrogen from the air, we can the more easily believe the assertion of a most successful New York farmer, now dead, that he bought no manures for many years, and although exporting a large quantity of nitrogen from his farm in the dairy products sold, he had kept it in a highly fertile condition by frequently growing clover in the rotation and using plaster freely. He did not know that the clover drew nitrogen from the air while he was thus using his clover crops to maintain fertility; but he was a thinking man, and he undoubtedly thought that that was just what the clover did.

Since this discovery was made of what the leguminous plants can do for the farmer and the horticulturist, it has been affirmed by some investigators that all kinds of plants, whether legumes or not, can get nitrogen from the air and work it up into chemical compounds; but so far as our ordinary crops are concerned it has been conclusively proved that if they are not legumes they can get their nitrogen from the soil only. Mustard has been more frequently mentioned in this connection than any other plant. The latest investigation of this question was made at the Department of Agriculture in Washington. The results thereof fully confirmed the results of all the careful experiments made before in Germany and elsewhere, to the effect that mustard, like wheat, oats, maize, and all the small and the large fruits, etc., can get its nitrogen only from the soil.

The question as to what causes the growth of the tubercles on the roots of leguminous plants has been much studied. These

studies have led to the conclusion that the bacteria are the first cause; that the tubercles are not something that the plant itself causes to grow, any more than the gallnuts on an oak tree are caused by the tree, or than the swelling after a mosquito bite is caused by the hand on which it appears. These bacteria can be cultivated as any plants can be cultivated; they are plants, not animals; they can be carried through many generations. Starting with some material taken from the tubercles on a pea root, it is planted in a suitable medium; from the crop thus obtained another planting can be made in a fresh quantity of the same medium, and so on indefinitely. This medium in which the bacteria can be made to grow and multiply, or this soil for bacteria, as it might be called, is a jelly-like substance of such a nature that the bacteria will live and thrive in it, as higher plants will live and thrive in a rich soil made up of sand, clay, and other things. From the last culture made of the pea bacteria a plant can be inoculated with all the usual results of such inoculation; the result may be just as satisfactory as if the inoculating material had been taken fresh from a pea root. In one case where a pea plant was inoculated in this way over 4,000 tubercles were counted on its roots. That which can be done with the bacteria of the pea can be done with those of any other leguminous plant.

Many experiments have been made in inoculating one species of a leguminous plant with bacteria from another species; such as the inoculation of a pea root with bacteria from a clover plant, or clover with lupine bacteria, and so on. These experiments have proved what has been stated before, that each species generally produces the most tubercles and gets the most nitrogen from the air with the help of its own kind of bacteria. The conclusion is also established that these bacteria are the only agency through which the leguminous plants can enrich themselves with nitrogen compounds made from free nitrogen and other substances drawn from the air.

It is a curious and very interesting operation by which free nitrogen is thus taken into the plant and converted into nitrogen compounds. It is really a partnership between the plant on the one hand and the bacteria on the other; the plant provides the bacteria with a suitable place for their underground home; the bacteria build their little houses there and then proceed in some mysterious way not yet understood to provide the plant with com-

bined nitrogen — thus, so to speak, paying rent for the root surface on which they have built their tubercles. The higher plant, the pea, bean, or clover, does not suffer any damage on account of these growths on its roots, constructed and occupied by the lower plants, the bacteria.

It seems probable that there are not so many species of bacteria as there are species of plants that can be helped by them. The pea is one leguminous species, the bean is another, lucerne another, and so on through the whole list. In no way whatever can we convert a pea plant into a bean or into clover. There are surely different kinds of bacteria, each one of which is best adapted to the work of getting nitrogen from the air for some particular species of legume; but these different kinds of bacteria are to one another somewhat as the different varieties of some one vegetable are to one another — such as the different kinds of squashes listed in the seed growers' catalogues, or of corn or cucumbers. It is now supposed that these kinds of tubercle bacteria are only varieties of one species; and that they are produced each one by growing on some one species of plant. Bacteria that have been growing and multiplying on pea roots for some years, season after season, are in some way different from those which have grown for a time on the bean; and those whose home has been the bean are not just the same as those that have grown on clover. If the pea variety of bacteria is used to inoculate a bean plant the result will not be so good as when the bean is inoculated with the bean variety; but if the descendants of these pea bacteria that were used to inoculate the bean go on living for a number of seasons on the bean plant they seem to become modified into the bean variety.

These bacteria thus seem to have a wonderful power of changing their character under changed conditions of their surroundings. They seem to be present in all arable soils, or at least in all soils in which leguminous plants have been grown at some previous time. When no leguminous crops have been grown for a considerable time in any field the bacteria seem to pass into a variety which will produce tubercles on any species of legumes, although not so abundantly as when the plant is inoculated with its own variety. This kind of bacterium, which can produce tubercles on any legume, has been named the *normal* tubercle bacterium. If a field has only normal bacteria in it, and if some one species of

legume is grown on that field for a series of years, the normal bacteria are supposed to be gradually changed into the variety that is best fitted for this species.

A very interesting illustration of this operation is described as follows: Twenty seedling acacias were set out in a plat where no legumes had been grown for a long time. The plat was surrounded by a narrow rim of land on which vetch had grown as a weed for many years. All the acacias that were in the more central parts of the plat grew well, and at the end of the season had tubercles on their roots, while those that were in the rim or near it made but a poor growth and had no tubercles. These results indicated quite plainly that the soil of the rim of the field was full of bacteria that had become so completely modified into the vetch variety during this long period of time that they were of no use to the acacias. It was also indicated that the bacteria in the central part of the field were the so-called normal bacteria, and were therefore capable of developing tubercles on the roots of any species of legume that was capable of having tubercles, and which might take possession of that part of the field.

Another interesting experiment illustrates this property of the tubercle bacteria. Twenty-two different species of legumes were inoculated or seeded with pure tubercle-bacteria from pea plants, and twenty-one of the same kinds of plants were inoculated with pure locust tubercle-bacteria. The first lot of bacteria could be considered as best fitted for getting nitrogen for the pea, and the other lot were best fitted for the locust. Sixteen of the whole number were not at all helped by the locust bacteria, and thirteen were not helped by the pea bacteria. Of those inoculated with the locust bacteria that did have some tubercles on their roots only one gained much benefit; that one was the locust plant itself. The pea inoculation was really successful only on the pea and the bean. Here again the bacteria modified by repeated culture into the pea variety were really useful only when applied to the pea plants, and the bacteria converted by repeated culture into the locust variety were useful only on the locust.

The distribution of these tubercle bacteria in the soil has not been much studied. The number of them would appear to be large enough, ranging as it does in some soils where legumes have been growing from 78,000 to 143,000 in one cubic inch of soil. They do not spread rapidly in the soil, and need the help of tillage

in order that they may be uniformly distributed. In one experiment six peas were planted in a pot of soil free from nitrogen; soon after the plants appeared above the soil one of them was inoculated by scratching the crown of its roots with the point of a needle that had been dipped in a tubercle of a pea plant from the garden. This inoculated plant grew to the height of forty-two inches; the other five made only half as much growth in height, and had each of them only half as many leaves as were on the other plant. At the end of the experiment tubercles were found only on the plant that had been inoculated; the bacteria seemed to remain right where they were put. Therefore if a soil is inoculated near the surface they will remain thereabout; if the inoculation is further down in the soil there the bacteria will be most abundant at the end of the season. In the first case the tubercles will be found mostly on the rootlets near the surface; if the inoculation is at the depth of eight or ten inches the tubercles will be found mostly on the rootlets at or about that depth. The importance of a thorough stirring of the soil for distributing the bacteria is thus clearly shown.

The tubercles are more abundant on plants growing in poor loams than in rich soils where the crops can find sufficient nitrogen without the help of tubercle bacteria; there being little or nothing for the bacteria to do, but few if any tubercles appear. The poorer the soil is in nitrogen, the more vigorous is their growth, for there is so much the more work for them.

These bacteria seem to possess a very great resistant power against decay and death. It has been observed that the same kind of bacteria may be found in the soil even if no legumes have been grown there for a long time. That they are there and ready for work is proved by the abundance of tubercles on the roots of legumes planted in that soil after such a long period. They probably live through the winter by producing germs or spores that can withstand low temperatures; these spores bear the same relation to the bacteria from which they were produced that the wheat or the barley seed bears to its parent plant. As illustrating the above statement, a test was made for the presence of bacteria in a soil in January; none were found then; in the following summer the soil swarmed with them.

Now let us consider the practical application of this copartnership between certain leguminous plants and the bacteria that build

their houses on the roots of these plants. The first tests with leguminous plants on a large scale for the improvement of soils poor in nitrogen were made in Germany. with peas, clover, seradella, and lupine, on reclaimed upland bogs and on sandy soils. The best results were obtained on the soils poorest in nitrogen, and especially on new soils. In many of the trials the crops failed entirely unless inoculation was applied. On very poor, sandy soils that were plentifully supplied with potash salts and the basic slag phosphate, a fertilizer much used in Germany to supply phosphoric acid for the crops, the results were wonderful. The same soils yielded very poor crops without inoculation.

The history of one of these trials is instructive. The plat was a small one; about twenty pounds of potash salts, nine pounds of slag phosphate, and twenty-four pounds of a soil in which lupine had been growing were scattered over the soil of the plat; the lupine seed was then sowed and the plat was harrowed to mix all these additions with it as thoroughly as possible. Other plats near by were left uninoculated, but were supplied with the same fertilizers as those that were put on the trial plat. There was no difference between the vegetation on the different plats as long as the plants could use the nitrogen of the seed. Eight days after the formation of the first leaf the plants on the inoculated plat had tubercles abundantly on their roots, while none were found on the roots of the other plants. Eight days later the darker green color of the inoculated plants was distinctly visible, and this difference became more and more marked as the season advanced. The crop harvested on the uninoculated plat was only 100 pounds; the yield of the inoculated plat was 475 pounds. In other tests of a similar character from two to sixteen times larger crops were obtained on the inoculated plats than on the uninoculated ones.

In the management of this kind of inoculation on a large scale the inoculating material must be taken from a field where the same kind of a crop has been growing that is to be grown in the field to be improved. Evidence enough has been given in what has gone before to show that a plant is almost sure to make a better growth and gain more nitrogen if inoculated with its own modified variety of the bacteria. The soil to be improved should be one that really needs nitrogen; time and labor will be wasted if this rule is not observed. The soil of this field should be well pulverized by tillage in order that the inoculating material can

be intimately mixed with it and uniformly distributed. The quantity of inoculating soil should be, according to one authority, from 1,700 to 3,500 pounds per acre of soil to be treated. The inoculating soil should be well pulverized; otherwise it cannot be uniformly mixed with the other soil. It is good practice to let this soil freeze and thaw two or three times after taking it from the field, for then it can be much more easily made into a fine powder. This inoculating soil should be scattered by hand and then mixed with the other soil by the harrow, but it must not be carried too far down; it is best to apply it when the seed is sown. If the soil is sour it should be sweetened by the addition of lime, with care not to add too much.

As has already been stated, lupine is the best crop to be used in case a very sandy soil is to be treated; vetch appears to be best suited for poor loams. Experiments have shown that the addition of a little nitrate of soda at the time that the seed is planted is useful; it serves to feed the plants in that short period during which they have to wait for the development of the tubercles on the roots — that little waiting time which begins when the nitrogen of the seed has been consumed; if the nitrate is added the plants will keep on growing while the tubercles are getting ready for them and no time will be lost.

In this connection an account of an experiment tried for the purpose of testing the comparative power of different legumes to gather nitrogen from the air will not be out of place. Thirty-one different species of plants were thus tested. Nine of them gained only 65 to 86 pounds of nitrogen, equivalent to from 390 to 510 pounds of nitrate of soda; seradella and two species of clover were in this group. Ten species gained from 88 to 143 pounds, equivalent to from 528 to 858 pounds of nitrate; in this group were two species of vetch, three of clover, and the kidney bean; the red clover made the largest gain, which is an important fact, as this crop is so widely grown in this country. From 175 to 220 pounds of nitrogen were gained by five species, one of which was a vetch, one a lentil, one the ordinary pea, and another the everlasting pea; these quantities of nitrogen are equivalent to from 1,050 to 1,320 pounds of nitrate. Three species of lupine, the blue, the yellow, and the white, gained respectively 275, 328, and 371 pounds of nitrogen, equivalent to 1,650, 1,968, and 2,226 pounds of nitrate. The great nitrogen-gathering power of the lupines is

very clearly shown by these figures. But whatever may be the capacity of one legume or another for gathering nitrogen, it will amount to nothing if there is not a good supply of available potash and phosphate in the soil.

The labor and expense involved in the inoculation of soils on a large scale in the manner above described are so great that an attempt has been made in Germany to prepare pure cultures on a large scale of the several kinds of bacteria which correspond to the different species of plants that may be used for gathering nitrogen, or that may be grown for sale or for fodder. If it is desired to inoculate the soil of a field where peas have never been grown so as to get a good crop of the same it is only necessary to buy a small bottle or a few small bottles of this material according to the size of the field to be planted, and with the contents to inoculate the soil, either by mixing the inoculating material with the seed to be planted or with a small quantity of fine dry earth and scattering this mixture over the soil to be treated. The labor and cost of this method of inoculation are much less than of the other method.

The substance used is called nitragin. Each bottle, costing in this country $1.25, contains material enough to inoculate somewhat more than half an acre. To inoculate the soil by the first method above mentioned the bottle is gently warmed to about the temperature of the body, its contents are added to a quart of clean, warm water and the mixture is thoroughly stirred; it is then poured on the seed to be planted and the whole is worked over with the hands till the bacteria are evenly distributed; some dry sand or soil is then mixed with the moist seed and it is ready for the planting.

In the other method of inoculation the water to which the contents of the bottle are added is carefully mixed with about fifty pounds of fine, dry earth; this mixture is then allowed to dry in the air, but not where the sun will shine on it, or it may be dried by mixing it with more of the dry earth; it is then uniformly scattered over the field to be inoculated, and harrowed in to the depth of about four inches.

This nitragin can now be purchased in this country through the agency of a German firm in New York. They do not keep it in stock, but order it from Germany as wanted. No less than nineteen different kinds of nitragin are listed in their little catalogue; two species of peas, three of vetch, one of beans, three of lupine, five of clover, and one of lucerne are included in the list.

In 1896 many successful results of the use of nitragin were reported in Germany; not only were larger crops obtained, but they were less injured by fungi than usual; for example, inoculated peas suffered much less from the blight than those that were not inoculated. In another case uninoculated vetch suffered much more from the attacks of an insect than did that which was inoculated. Some of the uninoculated plants died because so much weakened by the pests. It must be acknowledged, however, that the success of this method of inoculation is not yet fully assured. I have met with only a few accounts of its use within the last year, and I do not know how extensively it is applied at present. But the application is so inexpensive and so convenient, and so great are its possibilities as illustrated by some of the figures that I have given, that it certainly seems to me to be worth a trial wherever there are poor soils to be stocked with nitrogen. It should not be forgotten that one year's inoculation may answer, if successful, for three or four years thereafter. It should also not be disregarded that the amount of nitrogen gained by the inoculated vegetation is likely to be much larger than the quantity usually applied to the soil in such a fertilizer as nitrate of soda. Three hundred pounds of nitrate would be as much as any one would care to apply on a growing crop; this quantity of nitrate contains about one-sixth of its weight of nitrogen, or fifty pounds. A ton of nitrate costs now in Boston or New York about $40; at that rate three hundred pounds would cost about $6. Now, if you will read again the figures that I have given for the quantities of nitrogen that may be taken from the air by some of these inoculated legumes, and if it be allowed that even only half as much would be gained in the open field, where the plants cannot be so well cared for as in pots, and if it be considered that the crop can be used for fodder if so desired, and that nearly all the nitrogen in the crop will be returned to the soil in the manure, you will, I think, come to the conclusion that it is an economical way to increase the stock of nitrogen in your soils.

There is another way in which air nitrogen can be worked into a chemical compound; namely, by the action of the electric current on the components of the air; nitrate of soda can be made by this operation. It is stated in a recent scientific journal that where water-power is abundant for making the electric current,

nitrate of soda can be made at a cost of $25 per ton, while the nitrate from South America costs $37 at least.

Many of you may remember the flurry caused two or three months ago, when a most noted English chemist affirmed in a public address that the beds of nitrate of soda in South America would be exhausted early in the coming century; and since that fertilizer is our mainstay for the supply of nitrogen, the civilized world must fall into the condition of nitrogen hunger; or, as the lecturer expressed it, "England and all the civilized nations stand in deadly peril of not having enough to eat." It would not be surprising if many people should be really frightened by such a statement coming from such a source. Several competent writers have shown that there is at least no immediate danger of such a catastrophe. If we take into account the vast stores of nitrogen in our arable soils, the large quantity of nitrogen in the nitrate beds of South America, and above all the immense supply of free nitrogen in the atmosphere about us upon which we can draw *ad libitum* by means of our leguminous plants, and also by means of the electric current, there seems to be little danger that we shall "be in deadly peril of not having enough to eat," or even that our children's children will.

The atmospheric air presses on every square inch of surface of the earth with a weight of fifteen pounds. Four-fifths of this weight is due to the nitrogen in the air. In other words there are twelve pounds of nitrogen over every square inch of an acre of soil. Calculate the number of square inches in an acre of surface, multiply that by twelve, and you have the number of pounds of nitrogen over every acre of soil. The number is 75,271,680 pounds. A crop of wheat, straw and all, asks for only 48 pounds; further comment is unnecessary.

The lecture was illustrated with stereopticon pictures of the roots of nitrogen-gathering plants, which added much to its interest and instructiveness.

A vote of thanks to Professor Caldwell for his interesting and instructive lecture, in which he had brought before the meeting the latest discoveries of science on the subject, was unanimously passed.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, February 25, 1899.

A meeting for Lecture and Discussion was holden at eleven o'clock today, Vice-President BENJAMIN P. WARE presiding.

The following lecture was delivered:

THE AGRICULTURE OF ANCIENT TIMES COMPARED WITH MASSACHUSETTS AGRICULTURE.

By Hon. WILLIAM R. SESSIONS, Secretary of the Massachusetts State Board of Agriculture, Springfield.

Our knowledge of the agriculture of ancient times goes back only to the time since the flood. The history of agriculture among the nations of what may be called classic antiquity is involved in impenetrable obscurity, very few facts on the subject being recorded previously to the times of the Romans.

The Egyptians are supposed to have excelled in agriculture. Moses is the earliest writer, 1,600 years B.C. Agriculture does not appear to have materially changed in those countries even to the present day. Noah is styled a husbandman, and is said to have cultivated the vine and made wine. In little more than three centuries Abraham is stated to have had extensive flocks and herds and great wealth in gold, silver, etc. Isaac, his son, is said to have sown and reaped one hundred fold. Corn seems to have grown in abundance in Egypt, for Abraham, and afterwards Jacob, had recourse to that country in time of famine. Irrigation seems to have been practised in Egypt in Abraham's time, for it is said (Genesis 13, 10) that the plain of Jordan was watered everywhere "even as the garden of the Lord, like the land of Egypt." Later, in the days of Jacob and thence on to Moses, irrigation was common in Egypt.

The agriculture of Greece was learned from the Egyptians, and some ancient Grecian writers state that there were more than fifty ancient Grecian authors who wrote on agriculture. The works of only one of these appear to have been to any extent preserved. The necessary agricultural implements catalogued by this writer are a plough and a cart. The cart had two low wheels and was ten spans in width. The plough consisted of three parts, the shoe-beam, the draught-pole, and the plough-tail. The shoe-beam is to

be made of oak and the other parts of elm or bay. They are to be joined firmly with nails. Nothing is said of iron in its construction. The beasts of labor mentioned are oxen and mules. The oxen were most common, and four and a half years is given as the best age at which to purchase oxen. He also says that the most desirable age for a ploughman is forty; he must be well fed, go naked in summer, rise and go to work early, and have a sort of annual feast, proper rest, and good food and clothing; coats of kid-skins, worsted socks, and half boots of ox-hide in winter. The products of Grecian agriculture were sheep, goats, swine, cattle, mules, asses, and horses, the grains and legumes at present in cultivation, and the vine, fig, olive, apple, date, and other fruits. It does not appear that other than wild grasses or herbage plants were in use, no grass seed being sown. No doubt the other nations of that day had a similar agriculture, as they had the same opportunity to learn of the Egyptians.

The allusions in the Old Testament to the agriculture of the Jews are mostly incidental, but enough is said to prove that all the people, from the king to the poorest individual, were interested in agriculture, and that it was almost the only industry, ordinary manufactures being carried on in the family of the farmer rather than by people who devoted their whole time to such business. King David's farming was managed by seven officers. King Uzziah "built towns in the desert and digged many wells, for he had much cattle, husbandmen also and vine dressers, for he loved husbandry." Elisha was found ploughing with twelve yoke of oxen before him. Job had 500 yoke of oxen and 500 she-asses, 7,000 sheep, and 3,000 camels. Isaiah describes ploughing and sowing and threshing, and the threshing floor is often spoken of. Winnowing was done by the wind without the aid of machines or other contrivances except the common sieve.

The Phœnicians were agriculturists as well as traders, and no doubt they introduced their agriculture into their colonies at Carthage, Marseilles, and other places.

The Republic of Carthage included Spain, Sicily, and Sardinia, and flourished for seven centuries, and agriculture was doubtless early introduced there. When Carthage was destroyed by the Romans, 147 B.C., of all the contents of the libraries the Romans saved only the twenty-eight books on agriculture of the Carthaginian general Magon, and these were translated by order of the

government for use of the Romans, and from this grew up the celebrated Roman agriculture, described by Cato, Varro, Virgil, Pliny, and others. At that time the North of France, Great Britain, and the rest of Europe were in a wild state, inhabited by nomadic nations who lived largely by hunting, sometimes keeping flocks and herds, but seldom, if ever, cultivating the soil. When Britain and Northern Europe were overrun, the Roman soldiers, to all of whom the art of agriculture was familiar, carried on farming wherever they were permanently stationed. These soldiers also taught the art to the barbarian inhabitants of every country conquered by them. Thus was the improved agriculture of Egypt, Greece, and Rome made known and put in practice in the parts of Europe from which our ancestors came.

During the middle ages, after the fall of the Roman power in Europe, agriculture was extremely neglected and almost abandoned. Almost savage Saxons conquered Britain and systematically robbed the people of their crops and cattle. The result was a terrible decadence in agriculture. But when the Normans invaded England in the eleventh century they brought with them advanced ideas and practices in agriculture. Many thousands of husbandmen from the fertile and well cultivated plains of France, Flanders, and Normandy settled in the island and introduced the advanced methods of their own countries. Orchards were planted, lands were drained, rivers were diked. Norman priests and monks were good farmers, and the lands allotted to them by the conquerers were cultivated with great care, often by their own hands. They used ordinary manure or dung to increase crops, and also learned the value of marl as a fertilizer and used it quite extensively. The kings encouraged agriculture and sometimes issued edicts compelling owners to cultivate their land to a certain extent and in a certain way. The implements of this period were much like those of Ancient Greece, and they continued in use until about the time of our Revolutionary War.

About the year 1534 appeared the first English treatise on agriculture, entitled the "Book of Husbandry," containing directions for draining, clearing, and enclosing a farm and for enriching and reducing the soil to tillage. Lime, marl, and fallowing were strongly recommended.

Laws were made requiring the practice of improved agriculture and the raising of hops and flax; also requiring the castration or

destruction of horses that were not up to a certain size. The legal standard was fifteen hands in stallions and thirteen in mares, and unlikely specimens were by law consigned to death. Later sovereigns imported superior specimens of horses with which to improve the breed of English horses. Improved grasses for making hay were then unknown, and straw and hay of water grasses were the only dependence for winter fodder. Agriculture now began to improve. It is not singular that this beginning of improvement was contemporaneous with the invention of printing and the revival of literature which ensued as a consequence.

The "Book of Husbandry" before referred to was filled with wise advice and practical directions for the raising of crops and the breeding of cattle and horses, much of which was not improved until some centuries later, and some of which would be considered orthodox at this day. But some maxims and directions for farmers' wives would hardly be accepted by our wives and daughters today, especially by those who believe in woman's suffrage instead of woman's suffering. The author said, "It is a wives' occupation to winnowe all manner of cornes, to make malte, to washe and wringe, to make heye, sheve corne and in time of nede to helpe her husbande to fyll the mucke waggon or dounge cart, drive the ploughe, to load heye, corne and such other. And to go or ride to market, to sell butter, chese, mylke, egges, chickyns, capons, hennes, pygges, gese, and all manner of cornes."

Efforts for improvement continued and laws were from time to time made to quicken the pace. In Elizabeth's time (1563), as cattle were less plentiful than was desirable, a law was made forbidding the eating of flesh on Wednesdays and Fridays on forfeiture of three pounds. Great pains were taken to have it understood that it was a political and not a religious measure. It was not until 1645, twenty-five years after the landing of the Pilgrims, that clover and turnips were introduced into England. Potatoes were introduced into England in 1565, but did not attract much attention for nearly one hundred years. The advent of clover, turnips, and potatoes into Britain marks an epoch in the agriculture of our ancestors, for although the exciting and terrible times of Charles I., Cromwell, and Charles II. were depressing for agriculture as for every other industry, these important helps to stock raising and additions to human food began to have a marked influence throughout Great Britain and Ireland. Laws

providing for bounties on corn exported and duties on corn imported were also made and had a wonderful effect in stimulating British agriculture, but this was before the days of Cobden and free trade. Manufactures and commerce also increased wonderfully in England, beginning about 1760, and, with the consequent increase of wealth, gave a powerful stimulus to rural industry, and augmented agricultural capital, by creating a home demand for the products of the soil and the increase of the flocks and herds. Most of the inventions for economizing labor and increasing fertility have been introduced since the days of Cromwell. The wonderful improvements in the breeds of cattle, sheep, and swine have been made since the same date. Robert Bakewell began this great work about 1750 by improving his father's flock of sheep by selection and cross-breeding. Afterwards the same practice and principles were applied to cattle and swine and resulted in our improved breeds. The influence upon the cattle of England and America is almost beyond comprehension. The marked improvements in implements began about this time, for as before remarked, the farm tools of 1750 were hardly an improvement over those used in Egypt in the time of Joseph, or in Greece in Xenophon's time, or in Rome in the time of Pliny. This brings us down to the time of the beginning of farming in New England.

Allow me to go back a few years and note the changes in Massachusetts agriculture up to the present time.

Massachusetts agriculture began with the Indians. At the time of the landing of the Pilgrims in 1620 it was confined to the raising of Indian corn, beans, pumpkins, and tobacco. The methods of the Indians were of the crudest and simplest kind. They had no domestic animals for draft or burden, or for the supply of meat or milk. They had no knowledge of iron, and were dependent for tools upon what they could contrive out of the products of the chase and the forest, together with what assistance they could gain from the stones that could be selected from the surface of the earth. The land was all covered with forest and was cleared by burning down the trees and brush, and prepared for crops by digging with rude hoes made of clam shells, or the shoulder-blades of deer or moose, the handles being tied on with thongs of deer-hide or native hemp. The crops were cultivated with the same tools, and were even in that day fertilized by the application of fish, buried in the corn hills.

The first white settlers of Massachusetts knew nothing of these native productions of the country. They brought with them no teams or domestic animals, and only the rude hand tools of that early day. Their small stock of English seeds was mostly consumed to ward off starvation during the first terrible winter, and had it not been for the timely discovery of the Indians' store of corn, the whole party would probably have died of hunger. As it was, about one-half their number succumbed to disease, which was the result of privation and exposure, before the first crop was harvested. This crop was so slight that, without the aid of fish and game, they could not have lived through the second winter.

On the arrival of the second party of settlers in November, after the first harvest, their supply of corn was so small that the whole population was put upon half allowance until the next crop should be gathered. This next crop was but little larger than the first, and was all consumed before the third was harvested; and on the arrival of sixty emigrants, in July, 1623, they had only boiled lobster and fish, without bread or vegetables, to set before the newcomers. The third crop was more bountiful, but was raised without teams or ploughs. They had no mills to grind their corn, and it was boiled or roasted while soft, and parched, or pounded into meal when ripe. The following year, 1624, the first cattle were brought over. One bull and three heifers comprised the importation. They were small, and, measured by the standard of today, very inferior, but they were valued highly. The increase from these and other importations in the following years sold at very high prices. Twelve years later, in 1636, cows sold for from 25 to 30 pounds sterling, equal to from $125 to $150 of our currency, each. It must be remembered in considering these first cattle of Massachusetts that one hundred years later the weight of the beef cattle of England, in the Smithfield market, averaged only 370 lbs. per carcass.

All the agriculture of the colony for the first twelve years was carried on without a plough, by hand tools alone, and these made almost entirely of wood. In 1637, seven years after the settlement of Boston, and seventeen years after the landing at Plymouth, there were but thirty-seven ploughs in the whole colony, and these were made of wood with perhaps a rough iron point.

Potatoes were introduced in 1629, but were not much grown in the early years of the colony; in fact, for the first one hundred

and twenty-five years they were not considered an important crop. The first apples were gathered in 1639, nineteen years after the first settlement, and until after the Revolution this fruit was valued only for cider making, and the varieties grown were good for nothing else. The agriculture of the early settlers was only to raise something to sustain life, and their ideas of agriculture were as poor and crude as their cattle and tools. Their cattle were all wintered on wild marsh hay and summered by browsing in the woods. Grass seed was not sown except in experimental patches until the time of the Revolution, one hundred and fifty years after the first settlement and less than one hundred and twenty years ago.

The early settlers' hope of bettering their condition was not based on a better agriculture, for there was no home or foreign demand for agricultural products. The Spanish adventurers of that day were looking for mines of gold and silver; the English for opportunities for trade in furs and fish. New settlements in Massachusetts were made where the location promised good fishing, or trade with the Indians. During the first thirty years forty new towns were founded, among them Springfield, on the Connecticut river, a hundred miles straight into the wilderness. The condition of agriculture did not much improve until after the Revolution. The only demand to be supplied was for food and clothing for the farmer's family, and for the merchants, sailors, and fishermen of the colony. There was not a city in the State for the first two hundred years, or until 1822, within the memory of many now living. Until the War of 1812 the demand for farm products was too small to stimulate production. Since that time manufacturing, commerce, and trade have been increasing, cities and large towns have grown, population has rapidly increased, Europe has competed with our urban population for the products of the soil, and a market has thus been assured.

But as the demand increased our enterprising young men began to look for better land. The average soil of Massachusetts is hard and rough. Western New York and the Western Reserve afforded fertile soil at a low price, and almost an exodus commenced. From my own little town of less than eight hundred and fifty inhabitants, more than sixty young people in the heyday of manhood and womanhood left for the Western Reserve within ten years.

The increased demand for agricultural products also stimulated the enterprise of those who stayed at home. The attention of the foremost men of the State, wealthy merchants and professional men of Boston, and prominent farmers, had, soon after the close of the Revolutionary War, been attracted to the backward condition of agriculture, and they had been incorporated as the Massachusetts Society for Promoting Agriculture. Their efforts were zealous, but the people were not easily influenced to try new methods. This society raised money by subscription, published an agricultural paper, encouraged the formation of county societies, erected a hall for the exhibition of agricultural products, and paid large premiums for essays on agricultural subjects and for experiments in agriculture. It also imported specimens of the best breeds of cattle, sheep, horses, and swine, and placed them where the farmers could use them for breeding purposes at a nominal expense, and thus contributed largely to the improvement of the live stock of the State.

This society held a ploughing-match and cattle-show among the first in the country. At the first ploughing-match the old wooden moldboard plough was the only one in use. The first cast-iron plough made in sections was made in 1819. Previous to 1820 it had been almost impossible to create any enthusiasm for the improvement of methods among the farmers, but the growth of cities and large towns and the commencement of manufacturing had made a market, while the publications of the agricultural societies and the exhibition of the valuable imported animals now began to stimulate the farmers to effort for a better agriculture. The State Legislature was affected by the change of sentiment, and in 1819 provided that a bounty of $200 should be paid to county agricultural societies that should raise $1,000 for the promotion of agriculture, and in like proportion for any greater sum not exceeding $3,000, to enable them to offer premiums for the best domestic animals and agricultural productions. This law has been since modified so as to allow the payment of the same amount of bounty on the same conditions to all societies incorporated whose location is not within twelve miles of any other society receiving a bounty. With this encouragement the number of societies has increased, until we now have thirty-five agricultural societies, each drawing an annual bounty of $600 from the State treasury. The annual exhibitions of these societies, and the more

than one hundred farmers' institutes which they are required to hold each year, have done much to stimulate the enterprise of our farmers, and to introduce among them improved methods and implements.

In 1852 the Legislature established the Massachusetts State Board of Agriculture, composed of the Governor, Lieutenant-Governor, and Secretary of the Commonwealth as members *ex officiis*, three members at large appointed by the Governor, and one member chosen by each of the societies receiving a bounty. Since then the President of the Agricultural College, the State chemist, and the Secretary of the Board of Agriculture have been made members, *ex officiis*, and the Board now consists of forty-six members. The Legislature accepted the congressional grant of land for an agriculture college, and in 1863 incorporated an agricultural college which has been very successful and is a source of pride to the farmers and to the State at large. It is doing a good work for agriculture and for the liberal education of the industrial classes of the State. This college has received many liberal appropriations from the State treasury. The State Legislature in 1882 established on the grounds of the agricultural college the Massachusetts Agricultural Experiment Station, and supports it by liberal annual appropriations in addition to the fees received by the Director from licenses of dealers in and for analyses of commercial fertilizers. Laws for the regulation of the manufacture and sale of commercial fertilizers were early enacted and the Director of the Experiment Station is charged with the enforcement of these laws.

The great West has grown up, and with her gigantic agricultural resources has monopolized the production of the staple food products for the consumers of this country. It also exports hundreds of millions of dollars' worth of these products to Europe, but there is still abundant room for Massachusetts farmers. As these changes have driven them from the production of meat and grain for the markets of the world, the wonderful growth of Massachusetts cities and towns, the increase of her manufacturing and commercial classes, who are thrifty and prosperous and in receipt of good wages or liberal incomes, has created at the doors of Massachusetts farmers a demand for a class of agricultural products that Massachusetts farmers can produce at a profit.

A comparison of the total of Massachusetts agriculture with

that of other States by census statistics makes her agriculture appear of almost trivial importance, if we fail to take into account the relative area of the States and the proportion of agricultural population in the State. The productive area of Massachusetts is less than one-eighth that of New York, less than one-ninth that of Iowa, and less than one-twelfth that of Illinois. Illinois to be equal to Massachusetts in value of agricultural products according to area should produce such products to the value of not less than $636,000,000. The United States Census of 1895 gives Massachusetts a population of more than 2,500,000, or more than 320 people to each square mile of land area. This population is very largely urban, there being by the Census of 1895 thirty-nine cities and towns of over ten thousand inhabitants in this little State. There is no other State in the Union that has as many places of as large population. In addition to these there are forty-five towns that by the same census had between 5,000 and 10,000 inhabitants, making eighty-four municipalities of over 5,000 inhabitants in the State. There are also twenty-two towns having between 4,000 and 5,000 inhabitants in this State. These towns, 106 in number, would all be cities in many of the States, as several States incorporate cities when they have a population of 4,000.

We find also by the State Census of 1885 (I do not find this in the State Census of 1895) that of the whole number of males in the State only 8.28 per cent are engaged in agriculture. This includes farmers, farm laborers, gardeners, market gardeners, persons engaged in the care of animals and in the care of gentlemen's places. Of these, 36,221 are farmers, 35,531 are farm laborers, and 5,505 are other persons. There were by the same State Census 442,616 voters in the State, and supposing that all the farmers are voters, the farmers, including the market gardeners, are but one voter to twelve and one-half voters who are engaged in other occupations, and who represent the population that consumes agricultural products. I may interject here the proposition that this state of things should be taken note of when farmers are inclined to array themselves against the notions and prejudices of the consuming public of the State.

This condition of population shows us why a different kind of agriculture prevails in Massachusetts from that in the larger and less thickly populated States of the central, western, and southern

sections of the country. Our agriculture tends more and more toward the supplying of our urban population with fruit, vegetables, poultry, and dairy products.

By the last State Census (1895) the total value of agricultural products of the State was $52,693,633 — composed of dairy products, $16,301,549; hay, straw, and fodder, $12,491,090; vegetables, $6,389,533; fruit, nursery products, and nuts, including cider and wine, $3,207,806; poultry products, $3,871,318; meats and other animal products, $3,533,019; wood products, including wooden goods, $2,799,514; cereals, $1,104,578; greenhouse and hotbed products, $1,846,297; food products, including canned and dried fruits, vinegar and maple syrup, $516,787; other products, including about $400,000 worth of tobacco, $632,142. By the census of 1890, $594,053 worth of plants and $1,036,409 worth of cut flowers were sold in Massachusetts. Cereals, on which the great West so largely depends, cut but a small figure in the list. Dairy products, fruit, vegetables, meat, poultry, hay, greenhouse products, and a large proportion of all the others are sold in the near-by markets that our numerous cities and large towns afford. These are the lines in which future progress must be made.

Our consuming population is prosperous; many families everywhere among them have large incomes; most of our workingmen and salaried men are liberally paid. They want and can afford the luxuries of life. It is ours to provide them at their doors. If we provide what is wanted, when it is wanted, in honest and attractive shape, we can command remunerative prices. There is little to be hoped for from old-fashioned farming or from haphazard farming. The day is past when "any fool can be a farmer."

Discussion.

The Chairman remarked that after all the time agriculture has been pursued it seems strange how lately some valuable products have been introduced. He remembered when the first cast-iron plough was introduced; he rode a horse to scour the plough, which was done by ploughing in coarse gravel, the iron being very rough.

Varnum Frost asked what were the qualifications necessary for a farmer in order that he should succeed.

Mr. Sessions said that in his lecture he had in mind the condi-

tion of things a hundred years ago, when the brightest boy on the farm was picked out for a minister, a lawyer, or a doctor, while it was thought that the dullest boy on the farm would do for a farmer. The day for that has now passed. In reply to Mr. Frost's inquiry he said that the successful farmer was the brightest and most competent man, and he who loved his calling.

Mr. Frost said that he knew a man who was unable to read or write, who was as successful as any farmer he ever knew. In his opinion farming required good natural common sense, but a liberal education is not necessary. He thought he could tell any one, in five minutes, all there was to know about any branch of farming. Farming is a relief business for a decayed professional or business man.

A. W. Cheever moved that Mr. Frost have five minutes to tell the meeting all he knew about strawberry growing.

Mr. Sessions said that the farmer who was better educated through observation, and through comparison, would be most successful

Mr. Frost said that a farmer to be successful in his vocation today must be a successful business man first.

BUSINESS MEETING.

SATURDAY, March 4, 1899.

A Special Meeting of the Massachusetts Horticultural Society was holden at 10 o'clock today in accordance with the following request:

BOSTON, February 25, 1899.

TO GEN. FRANCIS H. APPLETON,
President Massachusetts Horticultural Society:

DEAR SIR:

The undersigned, members of the Society, respectfully request that a Special Meeting of the Society be called, to be held at as early a date as is practicable, to hear and consider a Special Report to be made by the Executive and Finance Committees, by which these Committees unanimously recommend that the Society purchase a piece of land on the corner of Boylston and Exeter

streets in the city of Boston; to determine what action the Society will take on that report; to consider and determine generally what action the Society will take in the matter of acquiring land for a new building, on erecting a building on such land if acquired, of providing funds for such land and building, and of disposing of the land and building now owned by the Society; and to transact such other business as may legally come before the meeting.

Francis H. Appleton,	J. Woodward Manning,
Benjamin C. Clark,	Geo. F. Pierce,
William C. Strong,	Robert D. Ireland,
Robert Manning,	Wm. Wallace Lunt,
Mary C. Hewett,	James F. M. Farquhar,
Charles E. Richardson,	John K. M. L. Farquhar,
J. H. Woodford,	Chas. H. Breck,

J. W. Howard.

In accordance with this request, agreeably to Section XII. of the Constitution and By-laws, the following notice was sent to every member of the Society:

Massachusetts Horticultural Society.

Boston, February 27, 1899.

Pursuant to the provisions of the Constitution and By-laws, at the request of twelve members of the Society, the President hereby calls a Special Meeting of the Society to be held at Horticultural Hall, 101 Tremont street, Boston, on Saturday, the fourth day of March, 1899, at 10 o'clock in the forenoon, to hear and consider a special report, to be made by the Executive and Finance Committees, by which those Committees unanimously recommend that the Society purchase a piece of land on the corner of Boylston and Exeter streets in the city of Boston; to determine what action the Society will take on that report; to consider and determine generally what action the Society will take in the matters of acquiring land for a new building, of erecting a building on such land if acquired, of providing funds for such land and building, and of disposing of the land and building now owned by the Society; and to transact such other business as may legally come before the meeting.

Francis H. Appleton,
President Massachusetts Horticultural Society.

Robert Manning, *Secretary.*

At this meeting the President occupied the chair and read the call for the meeting.

The President reported from the Building Committee that that Committee had unanimously voted to recommend to the Society the purchase of the Boston & Albany Railroad land at the southwest corner of Boylston and Exeter streets 16,000 square feet of land — 100 feet on Boylston street and 160 feet on Exeter street, at fourteen (14) dollars per square foot, subject to confirmation by this Society at a meeting to be called together immediately for that purpose.

The above vote of the Building Committee was embodied in a letter from the President to Messrs. Meredith and Grew, the brokers for the B. & A. R.R. Co., who replied in a letter which was read by the President, offering to sell 18,600 feet of land at sixteen dollars per square foot for 10,000 feet, and twelve dollars per foot for the remaining 8,600 square feet, making the whole cost $39,200 more than the offer of the Society. The Building Committee thereupon this morning unanimously passed the following vote:

Voted, That in view of the refusal of the Boston & Albany Railroad Company to accept the terms proposed by this Committee for the purchase of land on Exeter street, and the offer of another site at a much lower price, this Committee withdraws its recommendation to purchase the Exeter-street lot, and would submit the whole matter of the selection of a site to this meeting of the Society.

Benjamin C. Clark, of the Building Committee, in behalf of that Committee, offered the following vote and spoke in advocacy of it:

Voted, That it is expedient for this Society to move from its present building to a new one to be built for its use, and that it is desirable to procure land on the corner of Boylston and Hereford streets in the city of Boston for such new building, provided it can be obtained at a satisfactory price.

Francis Campbell moved that the Society purchase land on the northeast corner of Boylston street, fronting on the Fenway, opposite the Massachusetts Historical Society's Building, if the land can be purchased at a reasonable price. This motion was unanimously rejected.

The debate on the motion offered by Mr. Clark was then continued by Benjamin P. Ware, William E. Endicott, Edward B.

Wilder, George E. Davenport, William C. Strong, O. B. Hadwen, Rev. Calvin Terry, and Joseph H. Woodford.

Mr. Woodford made a motion to adjourn *sine die*, which was carried by a vote of 49 to 32.

The meeting of the Society on the fourth day of February adjourned to today at eleven o'clock. The special meeting continued until after that time, but no subject except the purchase of land and the erection on it of a building was brought up.

Adjourned.

MEETING FOR LECTURE AND DISCUSSION.

At the close of the business meeting, a meeting for lecture and discussion was held, Vice-President BENJAMIN P. WARE in the chair.

The following lecture was delivered:

QUESTIONS ANSWERED AND UNANSWERED; THE SEASON OF 1898 ALONG HORTICULTURAL LINES.

By WALTER F. TABER, Poughkeepsie, N.Y.

In many respects the season of 1898 has been a peculiar one in its climatic conditions, and in the results, more or less, of those conditions, many of which have been so striking in their results that I have thought to bring them to your notice somewhat in the order in which they occurred.

You will remember that the weather during March was unusually mild. At my place the frost was all out of the ground and men were digging raspberry plants on the 10th. There was no freezing weather afterward; some days very warm. Got plants dug; vines trimmed and tied. Nearly one hundred days of labor were accomplished in March. With the advent of April a great change took place. For ten days the mercury ranged from 18 degrees to 30 degrees.

April 2d was a cold, bleak, winter day; ground frozen hard. Cold, driving snowstorm; snow fell twice afterward, but soon melted. The months of March and April seemed to have changed places, and the question comes in here: What will be the result?

This question, in so far as it applies to the Marlboro raspberries, admits of an answer. The canes of the Marlboros, which had attained a very fine growth in the previous season of 1897, were

alive to the tips when tied to the stakes about the middle of March, but before the end of April a large proportion of the canes were dead from one-third to one-half of their length. What killed them? Answer: The warm weather of March started the flow of sap in the canes. The cold of April froze the sap and burst the cells, thus stopping the circulation in the leaves.

The last half of April was showery but seasonable. May was ushered in with a shower in the night, and the record of the month gives: 14 days without rain, 17 days with rain, 4 of them very heavy rains.

The week ending May 21st was memorable for its three heavy rainstorms. At this time cherries, pears, and the late strawberries were in full bloom. Pear trees of all varieties were literally covered with blossoms. My Gandy strawberries gave promise of an enormous yield. The outlook for fruit of every kind except apples (this being the off year for apples) was very promising. What was the outcome? Cherries were a very light crop. Pears, excepting Seckels, set but little fruit. My Gandy strawberries, that gave such promise, were almost a total failure, — very little but knots and buttons. Question: What was the cause of failure? I recollect that when attending the Annual Meeting of the Western New York Horticultural Society at Rochester, the subject of the failure of the apple crop in Western New York was under discussion, and Mr. H. S. Hooker said that whenever they had heavy rains at the time of blooming there was always a failure of the crop. Mr. George T. Powell writes me that he has not had a barrel of apples or pears to sell from his orchards this year (1898), and that he attributes the failure to the washing off of the pollen by the heavy rains. Another cause of the lack of fertilization lies in the fact that the rains prevented the bees from doing their work upon the flowers.

Mr. Powell writes me also that the foliage of his currants was affected by fungus, and that he sprayed with Bordeaux when the fruit was one-half grown, but, fearing the results to the fruit, left part unsprayed, with the result that those unsprayed lost their foliage, while those sprayed did not, and he gathered a very fine crop of currants. Along in October a number of buds on the unsprayed bushes blossomed and set fruit, and these buds were on the young wood growth of the present year. Question: What was the cause? Answer: The falling of the leaves checked

their growth and ripened the buds, and the warm wet weather following caused them to blossom and set fruit.

The year 1896 was the off year for apples, especially Greenings, in my section. My trees of this variety are large, probably fifty years old. They were covered with a luxuriant foliage. About the time for the setting of fruit, or a little later (no fruit being on these trees), the leaves began to turn yellow, the green matter being seemingly absorbed, until fully one-quarter of the leaves were of a bright yellow (not tawny yellow), and in a few days they all fell to the ground, and the trees resumed their apparently normal condition. Other kinds were affected somewhat, but not to so great an extent, while trees that were bearing fruit were but slightly affected. Question: What was the cause of this loss of color and consequent fall of the leaf?

The season of 1898 along this line has been full of surprises. A friend of mine living in the great fruit section on the west bank of the Hudson writes me that his apple crop has been a failure, and I will give you what he says in his own words:

"The first appearance of the blight was just after the bloom had fallen. I sprayed thoroughly with Bordeaux and Paris green at this time, as the fruit had set quite heavy; also sprayed again in about ten days, but these sprayings did not seem to have any effect. The foliage at first seemed wilted, and looked as if the branches had been cut off from the tree. After a few days many leaves turned yellow, and fell off; only a very little new growth of wood or foliage afterward. All the fruit dropped within two or three weeks.

"The varieties most affected were Newtown Pippin (called Albemarle Pippin in Virginia) and Spitzenburgh; then Baldwins, Greenings, and Vandeveres. The Hubbardston put out perfect foliage and matured a very heavy crop of perfect fruit, although this kind was among the others most affected.

"The trees that blighted the most were those on which the bloom was heaviest, especially the Baldwins." What was the cause of this blight of leaf and fruit, and what is the remedy? Answer: Cause — excess of water in the soil, diluting the food elements below the amount required to sustain the tree in crop production. Remedy — plant trees on well-drained soil. My friend goes on to say that he sprayed grapes and strawberries with Bordeaux, but with no apparent result, and pear trees with

whale-oil soap solution, but with no apparent benefit, but the application of Bordeaux and Paris green to his currant bushes for the currant worm and leaf blight, part sprayed once, and part twice, entirely destroyed the currant worm, and the foliage remained on the bushes very late. This coincides with the statement of Mr. Powell, and answers the question as to how to destroy the currant worm and retain the foliage of the plant.

This season of 1898 has raised a doubt as to whether the scientists at our experiment stations and colleges understand fully the origin of fungous growths and their manner of dissemination, and how and when and under what conditions spraying can be made most effective. I will here give you one of my own observations. We sprayed our grape vines once with Bordeaux, and later with the ammoniacal solution. Just as the early varieties were beginning to color the Concords showed some signs of rot, and we went through the vineyard and removed all clusters much affected and the affected berries from clusters showing only a few.

I frequently observed affected berries in the centre of those clusters, while those most exposed were perfectly sound. The question as to how or why this fungus should pass by these exposed berries and attach itself to one almost concealed from sight, remains to be answered.

I believe that a healthy plant, like a healthy person, is better able to resist the attacks of disease than an unhealthy one. But what causes the disease, and whether it must come from germs in the soil, or whether the elements are in the air under certain climatic conditions which can produce these results at certain stages during the growth of the plants, are questions of moment.

It has been suggested that perhaps the dampness of the berries retained on the inside of the cluster presented more favorable conditions for the growth of the spores than those on the outside of the cluster where it was exposed and dry.

I had no rot in 1897 in my Concords, and therefore no fungous spores in the soil, but had downy mildew on the Niagaras. The latter were not affected the past season, though weather conditions were more favorable for it.

My experience in the application of Bordeaux to the fruiting beds of strawberries was that it arrested to some extent the spread of the leaf spot, and perhaps I may as well state here that we mowed off the foliage after fruiting, raked it up, and removed it

from the ground. The new growth came up healthy and clean, but later the Marshalls rusted out badly, while the Gandys in adjoining rows remained clean. More leaf spot has developed on strawberry foliage the past season than ever before.

I have another friend, a prominent grower of fruit in the Hudson Valley, who has had a singular and to him puzzling experience in the treatment of his vineyard. He sprayed it five times, and his work is always thoroughly and carefully done. He had a light crop of poor quality, — most of it sold for wine purposes, — and his question is: What is the good in Bordeaux? In contrast to this a neighbor of his, owning a very large vineyard, writes me that he sprayed several times with a mixture of twelve and thirteen pounds of copper and nine pounds of lime to fifty gallons of water (this is the old formula as first made and used, but it proved to be a waste of material), and had a full crop with little or no loss. While on the subject of spraying I will state the experience of Mr. George T. Powell the past season in spraying his cherry trees for fruit rot, which threatened to destroy *his* crop as it ultimately did the crops of his neighbors. He first used two ounces of sulphate of copper in forty-five gallons of water, then increased to four ounces and later to six ounces to the same quantity of water, spraying the fruit thoroughly (sometimes twice the same day) and carefully watching results.

Finding that the disease was arrested, and fearing the stronger solution might injure the fruit, the quantity of copper was reduced to three ounces in forty-five gallons. Soon the decaying fruit dropped to the ground and half a crop of clean, perfect fruit was gathered, fully proving the efficacy of the spray. As I understand it, this treatment was recommended for trial by an Amherst professor. The result was particularly gratifying to him.

From Orleans County, N.Y., we have reports that some orchards carefully sprayed yielded light crops, while others not sprayed produced very heavy crops. Considering these results, does it not appear that other causes beside the apple scab fungus and codling moth govern more or less the production of fruit, and that, while we are not to leave undone the spraying of our trees and vines, we must seek to determine the cause of failure where these remedies do not avail? That while the spraying is absolutely necessary to the production of perfect fruit, the location of the orchard to insure perfect drainage, not only of the soil,

but of the air as well, and its proper fertilization, are the essentials that underlie and determine the productiveness and value of the tree? I have a friend living near me who has eighty acres of orchard wherein the requirements and conditions spoken of are very fully met, with the result that he secures large crops of such superior fruit that he realizes at least fifty per cent more for it than most others.

For years past much damage and loss has been caused by the discoloration and decay of the bark on the bodies of apple trees near the ground, and the grub has been charged with the damage, but recent investigations prove that it is a specific disease, known as apple canker. Experiments seem to prove that it is the same fungus that produces the black rot of the apple, pear, and quince, as the same fungus has been found on the blighted twigs of all these different fruits.

That the disease is of a very destructive character is proven by the fact that in one orchard of forty-five acres in East Bloomfield, N.Y., but ten acres now remain. It is found to be doing serious damage in other large orchards, and much good must result from these investigations, because this disease destroys the trees at an age when they are of the most value, not attacking young thrifty trees before the bearing age is reached. Now what is the remedy? It is believed that the remedy that holds in check the black rot of the apple, pear, and quince will avail to check the disease on the tree, because it is found that orchards which have been regularly sprayed with the Bordeaux mixture are much freer from it than those not sprayed. It is found that the disease lives in the rough bark of mature trees, and by removing this bark or spraying the body and limbs thoroughly this favorite breeding place will be destroyed, and also all spores that may chance to fall upon the body and limbs. Canker spots once formed cannot be cured, but the limbs on which they are should be removed wherever practicable.

The market conditions of the season of 1898 have been of so unusual a character that we hope they may never be duplicated.

It is an old saying that in union there is strength. The massing together of bodies gives force and power. This is true in the social compact, as has been shown in the union and unity of the North and South in our late war with Spain. But when the elements so conspire as to bring the productions of such a vast

extent of country into our markets so nearly together, as was the case this past season, the result is disastrous to all concerned.

The Route Agent of the Adams Express Company informed me that on the same day that the first car of strawberries was shipped from Highland, Ulster County, they had a car from Delaware and one from Oswego, bringing the products of this vast extent of country into competition with each other, flooding the market beyond its capacity, the result being that the fruit was sold below the cost of production, and in some cases below the cost of transportation to market.

On my recent visit to Delaware in January last I was told that many berries were left on the vines and many picked that did not pay for picking. In the report of the Transportation Committee at the Delaware meeting the same problem was presented.

This problem confronts every organization and is of vital importance to every individual shipper, showing both the organization and the individual the necessity of organized effort to compel, by State law or otherwise, the transportation companies to fix a schedule of charges on the basis of actual weight and not on supposed value as at present imposed. I found the same trouble to exist in this section on my visit to Taunton last winter, and I find it everywhere when one company has the monopoly in transportation.

I will cite this instance: The Pennsylvania Railroad will carry berries from Norfolk to New York City for less money than they charge from Central Delaware to New York on the same train, because of competition at Norfolk. The charges in the Hudson Valley have been materially reduced since the building of the West Shore Railroad, which runs through the fruit section, but the same trouble, the unequal charges upon different products, still exists, a thirty-pound crate of grapes being charged more than a barrel of apples weighing one hundred and fifty pounds. An express car loaded at Highland with twenty-eight thousand pounds of grapes for Worcester and Boston paid the express company nearly $200, distance two hundred and twenty-seven miles.

The regulation of these charges is a matter which the Legislative Committee of the Eastern New York Horticultural Society is investigating, aiming to effect a reduction.

There remains one question which comes to the front every-

where, and is not yet satisfactorily answered. It is this: What system can be devised that will enable the producer to get his proper share of the market value of his fruit? As it is a well-known fact that much of the fruit sent to market is of inferior quality, does not the answer to this question rest first with the producer, requiring him to raise the standard of quality? This can be secured by more care in production and selection, which would insure higher prices, and more margin for profit, with increased demand for the product. This, with the regulation of transportation charges and commissions by organized effort and coöperation amongst those having like interests, the results of which are seen in other lines of industry, would go far toward answering the question how the producer can get his fair share of the market value of his fruit.

I want to call your attention to some of the insect enemies of our fruits as gathered from various sources:

In the season of 1897 the damage caused by the larvæ of the saw-fly in some vineyards was very serious, and the remedies used did not avail to destroy it without at the same time destroying the foliage, which led to serious apprehensions of the danger to the crop in 1898. One vineyard of Delaware grapes failed to ripen its fruit because of loss of foliage, and the vines were seriously injured. Delaware, Empire State, Ulster, Brighton, and many vines of Niagara and Worden were killed in my vineyard.

Being on our guard in 1898, we were ready for the first worms that hatched, and while they were very small sprayed them thoroughly with Bordeaux and Paris green.

The spray must be thrown on the under side of the leaf, as they are on that side. By careful attention and spraying we succeeded in preventing any damage being done by them.

The most destructive enemy of our grapes, in proportion to numbers, is the white-faced hornet, which has strong, bony jaws with which he tears open the grape, and passing from one berry to another soon ruins the cluster. Honey bees and wasps follow and complete the work by sucking the juices.

I want to call your attention to the leaf curl of the peach as embraced in notes from Professor Duggar's address at the Eastern New York Horticultural Society's meeting:

In the early spring the young shoots affected by the fungus will be noticed as being swollen toward the tips and being pale in color.

When the leaves are out from a quarter to half an inch, if they show a deeply colored reddish tinge it is an indication that the curl will be on hand the coming season. This fungus, in its vegetative state, grows entirely within the tissues of the leaf.

The preventive treatment: three sprayings, Bordeaux mixture being preferred even for the earliest treatment, on account of its sticking to the twigs and buds much better than the sulphate of copper solution. Two sprayings before the buds opened showed the best results.

Two cases were cited where a strip of trees through an orchard which had been sprayed in the winter with lime to retard buds showed no signs of curl, or, at most, very little as compared with the rest of the orchard.

During my recent visit to Delaware I learned that the most serious enemy to strawberry culture in that section was the strawberry root aphis.

I heard of one field of forty acres that it had ruined, and think it right to warn you against the danger of its introduction by getting plants from sections where it is known to exist. I place it in the same list as the Peach Yellows and San José Scale.

Discussion.

In the course of the lecture Mr. Taber remarked that the grape saw-fly is found on the under side of the leaf, and that the larvæ look like currant worms. He had had splendid clusters of the Empire State grape, which he had saved for exhibition, destroyed by white-faced hornets. They are not very abundant, but he wanted to relieve the bees from the charge of destroying grapes; bees do not and cannot cut through the skin of the grapes. They suck the juices after the grape has been cut open by the hornets or sparrows. The consensus of opinion in regard to spraying is that the early sprayings do most good.

In reply to an inquiry, the lecturer said that the strawberry root louse can only be destroyed by destroying the whole bed.

The Chairman spoke of a case where apple trees wilted, when the undoubted fact was that the ground was so water-soaked that the digestive organs of the trees were unable to assimilate enough of the diluted food to sustain it. Hubbardston apple trees on a ridge where there was drainage were not affected in that way.

We must have ground so situated as not only to afford drainage of water, but circulation of air.

Mr. Taber said that George T. Powell, on a ridge road, saw an orchard in the same wilted condition, though there seemed to be sufficient drainage. Inquiry proved that the roots were water-soaked all through the season, for there was no time when a post-hole could be dug without becoming half full of water. The food was so diluted with water as to afford no nourishment.

Thomas Harrison asked if there are not many wet hillsides.

The Chairman inquired whether there was a clay subsoil in the ground referred to by Mr. Taber.

Mr. Taber replied that the ground referred to was a limestone soil, which ought to afford good drainage. But however high on a hill an orchard may be, if there is still higher land above it the soil may be too wet. You do not have to dig a well so deep on a hillside as in the valley. He lives on a hill in Poughkeepsie which is full of water; a well on the hill sixty feet deep always has forty feet of water.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, March 11, 1899.

A meeting for Lecture and Discussion was holden at eleven o'clock today, the President, FRANCIS H. APPLETON, in the chair.

The following lecture was delivered:

MARKET GARDENING.

By HERBERT W. COLLINGWOOD, New York, N.Y.

I hardly feel that it is possible for me to give words of advice to the market gardeners of Massachusetts. The methods that we follow at home on our little place will hardly appeal to expert market gardeners, who conduct large operations with abundant credit or capital. I have only a small story of a very small enterprise, and I shall simply try to tell my story in a few words, and let others build theories on it, if they care to do so. I have observed a tendency among older farmers and market gardeners to find fault with young men today, because they complain that farming is not as profitable as it was thirty or forty years ago. Most

of our wealthy Eastern farmers either made their money while high prices were obtained for crops during the war, or else the bulk of their money was made at mechanical work of some character, performed during the winter, so as not to interfere with farm operations. All this has changed today. The younger man finds himself face to face with very different situations. His prices have been cut in two, while the facilities for flooding his markets with products from distant points have been more than doubled. The competition is greater both on the farm and in the market. The land is less productive; in fact, the situation today before the young market gardener is, at first sight, far more serious than the situation which his father was called upon to face. I want to speak to these younger men, and more particularly to the young men in town and city, with small capital, who feel today the pinch that is coming from the grasp which the great monopolies have secured on industry. These great corporations are crushing out competition, and that means the discharge of thousands who will find it difficult to make a respectable living in town. What are they to do? From my experience, I can fairly say that the best opening before such men lies in the country on cheap land, made cheap because those who destroyed its character did not understand its possibilities. I can tell you that it is a great thing to be able to say, "I have saved a farm; I have given character and value to a despised and rejected piece of ground." That is the story I come to tell this morning, and yet I cannot stand up here and take the whole credit, for my friends — chemicals, cow peas, and Crimson clover — have done most of the work.

We were driven out into the country on to the soil. We found the farm the only place where one of moderate means can take care of a large family profitably. It came about that our family was filled up with people willing to work, yet without capital either of money or skill that would enable them to work alone to advantage. After looking the matter over carefully, I became convinced that poor land, or what classes as poor with the average farmer, reasonably convenient of access to the town, is the best place for poor men. Out of the poverty of the man riches may come to the land. I observe that in New York City, business men are not running away from the Battery for new building places: they simply put up twenty stories on the site of the old five-story building. They do not run miles away after cheaper

land on which to place a building of average height: they increase the capacity of the old lot. I can remember the time when it was thought necessary for a New England man to run west of the Alleghanies after a farm. I believe that now this is wrong. The man hunting for a home may imitate the business men, by getting hold of cheap, poor land near a town, and by mechanical means increasing its capacity for crop production. I have become convinced from my own experience that while cow peas and clover seed can be bought at a reasonable figure the man with moderate capital makes a mistake in running away from New England after a farm home.

In our own case we started too late in the season to buy or rent a good farm. The desirable pieces of land are always taken up early. With us in New Jersey one great standard of value in a farm is the amount of sod which it contains. Both landlord and tenant recognize the value of grass. They understand that one can grow a fair crop of almost anything by merely plowing under a thick sod. Under ordinary conditions a farm thickly set with grass will rent for twice as much as a farm on which tenants have plowed under all the sod. My judgment is that a poor man will do best to buy land which contains no sod, because such land is usually considered by the owner as of little value; that is, because most owners think it takes three or four years to obtain a heavy sod. One of the items of knowledge that becomes power to the poor man is the fact that with clover and cow peas one can produce this sod in six months and, after the first year, without interfering with other crops. Our farm was most unpromising as a market garden. For twelve years tenant after tenant had lived on it, taking what character the soil possessed out of it, and losing their own character as good farmers. The soil was light and thin, containing little besides weed seed and a bad reputation. This reputation, however, cut the rent far below the earning possibilities of the soil. We made a resolution that we would buy no stable manure, but that the farm must feed itself, except for the chemical fertilizers which we proposed using. In other words, the problem was to restore that soil to fertility by using high-class chemicals and green crops as manure.

The first year's crop did not pay. The fact must be stated right here that it is never fair to take one single year of farmin or gardening as a standard of what the land will do. Farming is a

business of a series of years, and it would not be fair to take any single year as a basis for figuring. We got the land well on the road to recovery, and we got our small fruits started, but we tried to raise too many crops. What with potatoes, sweet corn, tomatoes, melons, cabbages, and squashes, and half a dozen other things we had but small lots of everything. We have since learned the practice of raising enough small fruits, and keeping enough hens to pay our running expenses. Then, aside from that, a large crop of potatoes or sweet corn will give us a chance to handle the market better and bunch our work into a wholesale crop.

To hear some of the fertilizer dealers talk one would think that the fertility question may be settled by simply using large quantities of chemical fertilizer. Our experience shows that there are two sides to this matter. On that soil, no matter how heavily the fertilizers were used, we did not obtain more than a fair crop. We became satisfied that that soil required both lime and humus or organic matter in order that the fertilizers could give a good account of themselves. On light, open soils I have noticed that the organic matter quickly disappears or burns out. It is necessary to keep such soil well filled with organic matter in order to produce full crops. Our neighbors told us that we could not farm without manure. In one sense they were right, and yet they were wrong. That soil needed organic matter, but it was not necessary to use the dung of animals in order to produce crops. Most of our market gardeners import large quantities of stable manure from New York. When you come to think of it, their farms are fed from the West. The hay eaten by the New York horses may come from Ohio; the grain with which they are fed may come from Illinois and Wisconsin, and the straw with which they are bedded frequently comes from Iowa; in other words, our market gardeners are importing plant food from the Mississippi Valley in the form of stable manure. Now, the way we produce crops is different. Instead of going to the West for organic matter, we produce it in the same field in which the crop is grown. A summer crop is grown between frost and frost. After that leaves the ground a manure crop occupies the soil until it is time to put in another summer crop.

After a good deal of experimenting we have found that in nine cases out of ten the Early Black cow pea and Crimson clover will

make more manure for us than any other plants. The cow pea is sown on the higher and poorer parts of the farm. In any farm rotation there is a time when the soil is poorer than in other years. In most rotations the fertilizer or the manure is crowded upon one crop, and this heavy feeding is expected to produce the crops that follow. Where a man can buy a large farm at a low price he may take the lower and richer part for his truck and small fruit. Back on the hills he may make a short rotation of cow peas and corn, or cow peas and potatoes. One year this back land may be given entirely to cow peas, which are very easily grown. The land may be plowed or worked up with a Cutaway harrow and the cow peas either drilled or broadcasted and covered with an Acme or spiketooth. Then a crop may be left alone until the time comes to plow it in the following spring. The vines may then be plowed under and potatoes grown, using a fair amount of fertilizer. The following year the land may come back into cow peas, and so on year after year. By using a potato planter, riding harrow, and cultivator, and a strong potato digger, a farmer with only a moderate supply of help can raise potatoes in this way at a light cost without interfering with his ordinary fruit and garden crops. My own opinion is that for the town man who expects to make a home in the country, these large farms with an acreage of idle land will prove in the end most profitable. These back hill lands may be plowed and set with winter apple trees, as a farmer's capital permits. A rotation of cow peas and potatoes may be followed among the trees, while they are growing to bearing size.

We started the use of cow peas in one corner of the farm on a poor, thin, sandy field. It was so notoriously poor that the neighbors selected it as a place for burying their dead horses. Our first work was to chop this field up with the Cutaway harrow; it was covered with briers and dried mullein stalks. We applied at the rate of three hundred pounds of kainit and five hundred pounds of basic slag per acre. The same quantity of dissolved phosphate rock would have answered as well, except that the slag contains a large amount of lime, which we find very useful on poor, thin soil that has been exhausted of organic matter. After Cutaway-ing this field, we broadcasted five pecks to the acre of Early Black cow peas, which were worked in with the Acme harrow; in August we cut a part of this growth and used the vines for mulching strawberries, but most of the growth was permitted to die down on the

ground. A small amount of nitrate of soda applied to the cow peas will quicken up and improve their growth, but too much nitrogen would be unprofitable. The cow pea is one of those plants that absorb nitrogen from the air. My conviction is that when you sow this crop on land that is very rich, or where you use a large amount of nitrogen in your fertilizer, the plant will, from choice, take the nitrogen out of the soil, and will not prove so valuable as a soil improver. We are now raising the second crop of sweet corn after that crop of cow peas, and there is no question in my mind that the growth of vines was fully equal to twenty loads of stable manure per acre. Where the vines were worked into the ground the corn has a better color and is far better able to withstand the drought. I have noticed both in corn and potatoes that where a thick mat of cow peas was turned into the ground the crop was far better able to withstand a drought. In this respect I think green manures are superior to stable manures, as the latter appear to dry out more quickly and are not so useful for holding moisture. The objection to the cow pea is that it requires practically the whole season to make its best growth. I have, however, sown the peas after a crop of early potatoes and secured a fair growth before frost. We have also sowed the cow peas among the currants, raspberries, and other bush fruits, with very fair results. The first sharp frost, however, kills the cow pea, and in order to make it most useful it is necessary to give it an entire summer for its growth, although it may be sown after such crops as early peas or lettuce. My advice, however, would be to use the cow pea on the poorer lands of the farm. Where one has considerable idle land, it would be safe to keep one-fifth of the farm constantly in cow peas, which would be a cheap and effective way of manuring. My advice would be to use at least seventy-five per cent of the potash and the phosphoric acid on the cow-pea crop, with perhaps a small amount of nitrogen. The balance of the fertilizer I would use on the crop following the cow pea, and in my experience potatoes or sweet corn have given the best results for this purpose.

With us Crimson clover has proved a very valuable soil improver. We usually sow it in the sweet corn at the last cultivation. Seed at the rate of twelve pounds per acre is broadcasted through the standing corn, then the cultivator is used with a wide block or board hanging behind so as to scrape or level down the

soil. If possible the clover should be sown just before or just after a shower. If the conditions are right, it will come up in thirty-six hours. Its first growth is feeble and you will be likely to lose confidence in it half a dozen times before the fall is over. The first time we used it we became thoroughly disgusted with the plant; in fact, we harrowed part of it up and sowed rye in its place. In September, however, when the cooler weather came, the plant suddenly began to jump, and before long covered the ground with a thick mat of green. With us the clover has lived through the winter five years in succession. It seems to keep on growing beneath the ground even during the coldest weather. In the spring, when the growth above ground seems puny and insignificant, you will find an immense root system fully developed and of great value as a fertilizer. I would sow the seed year after year, even if I knew it would not live through the winter, for the growth it makes during the late summer and fall is, in my opinion, of much greater value than any growth of rye or ordinary winter crops could be. With a poor farm, once every fifth year in cow peas, and Crimson clover always following the sweet corn, or other early crops, there will be no need of stable manure, beyond what can be made on the average-sized farm. With fair dressings of high-grade fertilizer, in connection with the clover and cow peas, I am satisfied that poor land can be slowly but surely brought back to a high state of fertility at a profit.

Having done this, the problem comes down to a question of selecting the most profitable crops for one's locality. This year we have about an acre of strawberries, about six hundred plants each of red raspberries, blackcaps, and blackberries, which with three hundred hens will pay our running expenses. By running expenses I mean the grocery and meat bills, the feed for the stock, and the incidentals or current expenses which occur on every farm. After a good deal of study and experiment we decided that for our locality a combination of potatoes, sweet corn, and cabbages would pay us better than anything else. We have this year about fifteen acres of potatoes, ten acres of sweet corn, and plan to turn out about twenty thousand head of cabbages. Two men with an occasional boy's help will do this work. Potatoes are our main crop, and we use a combination of potato-growing tools which give but little hand labor. We plant with a potato planter, and ride on the harrow, the cultivator, and the digger.

With this combination, and, in addition, a bicycle weeder and a sulky plow, two one-legged men could plant and care for thirty acres of potatoes, and produce a fair crop. The "man with the hoe" has, in my opinion, seen his best days in this class of farming. Today, in order to compete with the West, we must adopt many Western methods. I think the potato growing of the future will be largely on the back fields, with the short rotation of cow peas and potatoes which I have mentioned, and with a full set of potato-growing machinery. This is one reason why I think the young man from the town buying a poor farm will do better to go a little farther into the country and buy a large farm where there is a good deal of idle land. His profit will be made by harnessing those idle fields with the cow-pea vines, and putting them to work. The poultry, small fruits, and truck business can be crowded upon the lower and level part of the farm. We raise a large acreage of early potatoes, having found that, one year with another, the early varieties bring more money than the late ones. This is because there is less competition with the early crop. The only competition with earlies is from the territory that lies south of us. For late potatoes, the entire West and North become our competitors. Again, after growing a crop of very early potatoes, the ground may be worked up at once and drilled to cow peas. These cow peas should be cultivated the same as beans or corn, and at the last cultivation Crimson clover seed may be sown exactly as it would be in the corn crop. If the weather is wet enough the clover seed will sprout and grow after the cow peas are killed by the frost, thus giving us a humus crop for the next year, or by transplanting our late cabbage plants twice we may finally put them in the soil left by the early potatoes, and in this way produce two crops from the land. With us, the earliest sweet corn pays best, as we usually grow it on the lightest part of the farm, and thus push it along early. The bulk of our crop consists of Crosby and Perry's Hybrid, with a small proportion of Evergreen for the late market. We use horse tools as far as possible in caring for our crops, beginning with the weeder and following with a two-horse cultivator. The ground is kept thoroughly stirred and we do not find much occasion for using the hoe. Strawberries with us have not proved very profitable except for a small local trade. As I have said, the small fruit and the eggs keep us running, while potatoes, corn, and cabbages are

expected to do the heavy work. This system of farming or gardening may not appeal to the gardeners on rich land near the towns, who command a heavier capital and produce larger crops than we do. I have no thought of instructing them in their business; in fact, I am talking to an entirely different class of men — those who are called upon to face the situation as it exists to-day. Out on the farms and hillsides that are at present idle and almost valueless, I believe there are golden chances for young men who have that best of ambitions, the desire to establish comfortable homes of their own. It requires pluck and energy and self-denial to pull away from the early home places, and cross mountains and the great rivers to carve a new home in the far West. Happily, the day has gone by when such migration is necessary. Right here in New England there are opportunities for the best efforts of the strongest men. I should count it a great privilege to be able to say, after a struggle with one of these old New England farms: "I have done something for my country; I have saved a farm. I have given character and strength to an abandoned and neglected piece of ground. I have saved a farm from the wilderness. I have saved a farm for my family; saved it to stand as the best monument that I can possibly leave behind me. I did not take rich and fertile land which asked only to be tickled with the hoe in order to make it laugh with the harvest, but *I have saved a farm;* saved it for my country; saved it for New England. I have saved a farm. I have done my duty!"

Discussion.

The lecturer said, in reply to inquiries, that he was born and brought up among small independent farmers on Cape Cod. They were crowded out by farmers with large capital who pursued scientific methods, and began to feel that there was no place for them there. He thought so himself until lately, but now his views have changed, and he believes that these small farms are the only places where a large family can be brought up safely. He had a large accession to his family, and it became a question what to do with them. He went twenty-five miles into Bergen county, N.J., hunting for a farm, and found all the desirable ones taken, but he found one where five tenants had nearly starved.

Varnum Frost asked the lecturer whether he kept a debit and credit account with his farm.

Mr. Collingwood replied that in two years the farm doubled in value, and that he supported a family of ten from it during the same time. If he had had a capital of one thousand dollars, to put half into stable manure and half into fertilizers, he could have brought up his farm much more rapidly. His method would be of no value to a capitalist, or on rich ground. He got basic slag at a bargain; otherwise he would not have bought it. He would buy stable manure if he could get it at a very low price. His idea had been to carry on and improve his farm with very little capital. He would not say definitely that any man can do what he has done, but he means to stick to it. The boys who work on the farm are members of his own family; his brother-in-law does most of the work.

Benjamin P. Ware thought it due to the lecturer to say a few words in recognition of him. He had taken two positions: he had discarded the plow and stable manure, and the speaker thought it was not right to let such fallacies go abroad without any expression of dissent. But he has proved that a family can be supported on a poor farm. Now, however, he has come round and uses the plow and stable manure. Mr. Ware said that Crimson clover is not useful here; cow peas are. He cautioned against planting cabbages where pigs have fed off the Crimson clover; they will all be stump-footed. In answer to an inquiry by the lecturer, as to what he would plant in such a place, Mr. Ware replied that sweet corn or melons would grow there.

Mr. Collingwood said that in New Jersey, when the peach crop fails they put in melons, thinking that they will form a substitute.

Hon. Virgil C. Gilman expressed the hope that, now that we have got acquainted with Hope Farm, the notes on it in The Rural New Yorker would continue, and that they would be made fuller, and that a plan of the farm would be given. Such notes would be read with intense interest.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, March 18, 1899.

A meeting for Lecture and Discussion was holden today at eleven o'clock, Vice-President BENJAMIN P. WARE presiding.

Before introducing the lecturer, the Chairman remarked that

yesterday, the 17th, was the seventieth anniversary of the organization of the Society, and he then spoke as follows:

It seems fitting that the seventieth anniversary of this Society should not pass without noticing the grand results of its work since its organization. The Massachusetts Horticultural Society was formed by men who were deeply interested in promoting improvement in the beauty of flowers, in the quality of fruits and vegetables, and in beautifying our homes as well as public grounds and highways, thus becoming benefactors to mankind. How well they and those who followed them have succeeded in their efforts is shown by the wonderful improvement that has been effected in the products of our gardens and fields. Without giving details, I may say that there is scarcely a cultivated flower that has not been so changed and improved as to be hardly recognized as the same as those of seventy years ago. The same is true of the fruits and vegetables that supply our markets. While this is the earliest incorporated horticultural society in the country, it was not the first organized; there were several of earlier date that have since died of inertia. It may be too much to claim that all of the improvements above mentioned have been caused by this Society, yet through the liberal premiums paid for the best specimens exhibited at our annual and weekly shows, and the patient, persistent efforts of our members, much, very much, may be justly claimed as accomplished by this Society. Mount Auburn Cemetery took its origin from this Society, thus giving an object lesson that has manifestly shown its effects throughout the whole country, not only in beautifying cemeteries and public parks, but, by creating public sentiment, making these possible. By the foresight and good management of the fathers of this Society, the foundations were laid for the best horticultural library in this country, and for ample financial endowment sufficient, with equal good management in the future, to secure for all time the ability for continual advancement in the line of its past history. Following the example set by this Society, about two hundred similar organizations are in successful operation throughout the country. So it appears that the efforts of those few noble men, the fathers of this Society, have resulted in cumulative good to us that is measureless and priceless. They builded better than they knew. All honor to their memory.

The following lecture was delivered:

Horticulture in Japan.

By John K. M. L. Farquhar, Boston.

The thoughtful horticulturist cannot have failed to note how large a portion of our ornamental trees, shrubs, vines, and flowering plants have come to us from Japan.

Among the last autumn attractions of our gardens were the unrivalled *Hydrangea paniculata grandiflora*, and the fragrant and beautiful *Clematis paniculata*, while the walls of our dwellings were radiant with the crimson and yellow foliage of the Japanese woodbine (*Ampelopsis Veitchii*).

Not only are our greenhouses during winter adorned with her camellias, spiræas, and lilies, but while the snow covers the ground, our parks and fens are enlivened with the shining cardinal berries of her drooping barberry.

Early in summer, the scarlet quince (*Pyrus Japonica*), the yellow corchorus, purple akebia, and numerous white and pink spiræas come as forerunners of an almost innumerable host of shrubs, trees, and vines, which uninterruptedly represent Japan in our floral decoration. Nor can we forget such popular things as her wonderful maples, conifers, irises, lilies, and pæonies. It was the contemplation of these facts that prompted me to visit Japan last summer.

Nagasaki, the southermost port of Japan, is of interest to horticulturists because for over two centuries it was the gateway through which the floral treasures of the country found egress.

From 1637 to 1859 the Dutch were the only western people having intercourse with the Japanese, and to the scientists associated with their settlement at Deshima we are largely indebted for the introduction of Japanese plants. Many of their introductions have been named in their honor, and thus the memories of Kaempfer, Thunberg, Siebold, and others, will live so long as mankind is interested in horticulture.

The first requisite of the visitor to Japan is a passport from the Japanese Government, and to secure this it is necessary to visit the American consul. The consulate is situated well up the southerly hills which enclose the bay, and is surrounded by a beautiful garden; in fact, it is said to be the finest consular residence in Eastern Asia. We find here extensive banks of azaleas,

clumps of *Cycas revoluta*, *Eulalia zebrina*, *Aucuba japonica*, and pink and white oleanders.

There are wistaria arbors, bamboo hedges, and a fine selection of shade trees. In a secluded corner we find a Japanese garden and hanging about the verandas, fine balls and figures of the interesting Japanese fern, *Davallia bullata*. The climate is humid, and even the stone walls soon become covered with a natural growth of ferns; chiefly *Pteris Cretica*, *P. serrulata*, and *Polypodium hastatum*.

Receiving my passport, I was impressed with one of its five warnings — that the traveller must not cut or injure any tree. I found Consul Harris an enthusiastic agriculturist, and his suggestions as to my trip were helpful.

Proceeding through the city, we encounter plant pedlers and see the dwellings decorated with pot-grown morning-glories, or cut flowers, chiefly lilies, hollyhocks, œnotheras, and the wild *Patrinia scabiosæfolia*.

Half-an-hour's ride by jinrikisha through the city and along a canal or stream overhung by cherry trees and willows brought me to the O'Suwa Temple, famous for its camphor trees. When Robert Fortune visited this place fifty years ago, as the guest of Dr. Siebold, whose residence was near by, he described these trees as being much the largest specimens of camphor he had met with. But Dr. Kaempfer had written a description of these gigantic trees when he resided at Nagasaki two hundred years ago, and at that time they were six hundred years old.

From Nagasaki I proceeded over the hills, which are terraced for the cultivation of rice and overflowed by streams from the mountains. It is usual to plant the narrow embankment around each terrace with a row of soja beans.

Ascending the higher hills, I passed through several dense forests of Japanese bamboo, a very important plant to the Japanese, and descending towards Mogi numerous patches of *Caladium esculentum*, grown for its esculent root; also the white lotus, of which the starchy rhizomes and the capsules are eaten, the latter having the flavor of almonds. Mogi is a fishing village on the bay of Shimabara, with fine specimens of *Pinus Thunbergii* around the water's edge.

Crossing the bay in a small steamer to Obama, I proceeded up the mountains on horseback to Unzen, famous for its sulphur

springs. The road or trail is a rough one, but there is no part of it without interest; among the forest trees I saw many fine camellias, while under them was a tangle of shrubs among which were *Hydrangea paniculata*, azaleas, *Rosa Wichuraiana*, and *Lonicera Japonica*. I found, too, numerous ferns — large spreading fronds of *Woodwardia Japonica*, *Nephrodium sophoroides*, and such delicate sorts as *Davallia tenuifolia*, *D. Mariesii*, and *Adiantum monochlamys;* also the climbing *Lygodium Japonicum* and rampant *Gleichenia*.

Part of the journey is over hills devoid of trees, and here, while pausing for rest, I gathered blooms of *Astilbe Japonica*, *Lilium Maximowiczi*, *Lychnis Sieboldii*, a species of *Inula*, and several varieties of *Ipomœa*.

When I entered Unzen I found I had to keep to one side of the street, the greater part of it being taken up with mats on which plums were being dried in the sun. The traveller should avoid eating fruits dried in this manner, as well as pickles which are exposed in uncovered vessels on the sidewalks; both are liable to cause cholera.

There are forty-three hot springs about Unzen, discharging clouds of sulphurous vapor into the atmosphere. One inhales sulphur with every breath. It seems to have no deleterious effect on vegetation; on the contrary, nowhere in the south of Japan is there more healthy foliage than here. While I noted the boiling hot water conducted in bamboo pipes to the various bath-houses, I thought how acceptable to some of our Boston cultivators would be a current of this blight-destroying vapor, fresh from nature's laboratory, could it be turned into our greenhouses.

Passing through the Inland Sea, with its three thousand or more islands, one cannot fail to note how many of the little islands are terraced and cultivated, while boats, with their crews collecting seaweed for fertilizer, are frequently passed. Although I had sailed through the Inland Sea twice, I desired to learn more about its islands; therefore on arriving at Kobe I sailed back by a small steamer to the sacred island Awaji.

Near Sumoto, the largest town on Awaji, I saw many pine trees with singular roots. The sandy soil out of which they are growing is evidently being gradually washed away, leaving the larger roots high in the air, until they look like, and in fact become, props supporting the trunk and branches.

The Japanese are not only close observers of nature, but skilful

imitators, and they have learned to produce pine trees with aërial roots four or five feet above the soil, and they are offered for sale in Tokio. Riding about twenty miles along the coast, I found many of the ferns previously mentioned; also *Clematis*, *Ampelopsis Veitchii*, *Arundo donax*, *Rosa Wichuraiana*, and *Clerodendron trichotomum*, the last a shrub with clusters of white and cardinal colored flowers of exquisite beauty, which unfortunately is not hardy in New England.

The staple product of Japan is rice, and there are about fourteen varieties in cultivation; some maturing in September, others in November; some requiring inundation during the whole period of growth, others only while they ear out; and lately varieties have been found which yield a good crop on dry land.

The seed is sown in April or May, and transplanted in a month or six weeks later. Where possible, the fields or plots are kept overflowed by streams from the mountains; elsewhere wells are resorted to, and it is not uncommon to see scores of well-sweeps operated by women, with a bamboo screen protecting them from the sun.

The fields are enriched chiefly by liquid applications. At the corner of each plot there is a cement cistern in which the liquid is prepared, and from which it is bailed to the rice ground and distributed by the overflowing water. When the crop is harvested, the only preparation needed for market is husking, an operation performed by treadmills, and which may be seen daily in the villages.

In the southern part of Japan a kind of indigo is grown to considerable extent, the color being developed by allowing the sap of the green leaves when picked to ferment in the sun. The leaves are spread on mats on the public streets; first, several inches deep to promote fermentation, after which they are turned over and spread in thin layers to dry. The growing crop looks like beds of spearmint.

At Kobe there is a public square with fine cherry trees, *Cycas revoluta*, and magnificent pink and white oleanders.

The pomegranate and Lagerstrœmia are among the striking ornamental trees which attract the traveller.

Not till I had reached Nara did I see the noble, sombre Cryptomerias, but there in the sacred grounds of the temples, where no one dare injure them, I found giants which had been stately trees before the famous Cryptomerias of Nikko were planted.

At Kyoto I found more horticultural work carried on than elsewhere in the south. At the suburb Arashyama there is one of the finest groups of cherry trees in Japan. Then the gardens of the Ginkakuji and Kinkakuji have for centuries been the models for gardens throughout the country. The Kinkakuji garden represents the Inland Sea, with its curious islands, rocks, and pines. The Japanese landscape gardener follows nature closely; the garden must contain no plant, shrub, or tree foreign to the scene he reproduces.

In a court of the Kinkakuji there is the most remarkable trained tree in Japan. It is in the form of a sailing junk; the hull (which is now about forty feet long and fifteen feet wide) being formed by the lower limbs, while the trunk and upper branches represent the mast and sails. This tree has been in training about three hundred and fifty years.

At Karasaki on the borders of Lake Biwa there is another remarkable pine, which is over a thousand years old. Its trunk is thirty-eight feet in diameter, and it has three hundred and eighty great horizontal branches extending from north to south nearly three hundred feet, and from east to west about two hundred and fifty feet.

Ten miles south of Kyoto are the famous tea gardens of Uji. They produce the finest teas in Japan, which often command from five to seven dollars a pound. Tea was introduced into Japan from China in A.D. 805, and the gardens of Uji have existed for about eight centuries. Two kinds are grown: a small-leaved variety which yields two pickings a year, — the first about the second week in May and the second about the end of June. The other sort, which has larger leaves, yields one crop about the middle of June. The small-leaved sort is the most esteemed, and the first picking is considered the best in flavor.

It is now well known that the color of tea depends entirely on the treatment of the leaves after being picked. If green tea is desired, they are fired immediately; while for black, they are spread out on mats or trays, the sap being allowed to ferment in the same manner as we observed practised with indigo, and then fired. The curl or twist is imparted to the leaves by turning and shaking them while in the firing pans.

Proceeding north, I stopped at Gotemba, where I saw growing wild many varieties of lilies, particularly *Lilium longiflorum* and

L. auratum. Exporters rely largely on collected bulbs of *L. auratum* for their stock. The other sorts are chiefly cultivated.

I was surprised to find that the bulbs of wild lilies were usually from a foot to two feet below the surface of the ground. They succeed admirably in the decomposed lava which forms the soil of Gotemba, as they have abundance of rain and ample drainage. Here, and also at Ofuna, there are extensive fields of *Lilium longiflorum*, *speciosum* sorts, and *auratum*. The fields are arranged so that they may be flooded or dried at will. The increase in lily-growing in Japan has been very great of late years, owing to failure by disease in both Holland and Bermuda. About two and a half millions of *Lilium longiflorum* bulbs were sent from Japan to the United States in 1898.

The greatest horticultural centre of the country is Tokyo. Mr. Veitch, of London, in his notes on Japan, has stated that the nurseries about Tokyo exceed those of Boskoop, Ghent, the bulb grounds of Holland, and the seed grounds of Erfurt and Quedlinburg combined. This is a bold statement; yet, having visited all these places, I am of opinion that it is no exaggeration. Some of the nurserymen carry miscellaneous stocks, while others are specialists.

Some nurseries are devoted to *Cycas revoluta*, which are grown as large specimens, or dwarfed by twisting and tying down the leaves. Many of the plants have small crowns grafted into the lower part of their stems, giving them curious forms; some of them are worth two hundred yen.

The morning-glory nurseries are particularly interesting. The plants are grown in pots, wall pots, or hanging baskets, and the variety of colors and forms is endless. Flowers five inches across are frequent; there are also many double-flowered sorts. The finer sorts are grown only as pot plants; they are not sown in the open ground, as with us.

Some nurseries are devoted to ornamental-leaved maples. In one I found over eighty distinct sorts.

Many travellers are most taken with the tree nurseries, where such conifers as *Pinus parvifolia*, *Pinus Thunbergii*, *Thuja obtusa nana*, and *Retinospora filifera* are dwarfed and stunted in small pots. Many of the trees seen are said to be three or four hundred years old. Ivies, several varieties of Podocarpus, and maples are also employed for dwarf cultivation. These trees, I think, will

never become popular here; the labor of caring for them is too great, and a few weeks of neglect will ruin the work of generations.

The nurseries of Tokyo are enclosed with hedges of Cryptomeria, Camellia, or Bamboo.

Between Tokyo and Yokohama the traveller is struck with the beautiful groups of pink lotus, which occur among the rice fields. At Kamakura there is quite a large pond filled with this lotus; there are also extensive beds of *Iris Kœmpferi* grown for export. Here, too, there are groups of *Chamœrops excelsa* planted in clumps like forest trees.

In this region we pass through extensive orchards, the trees — apples, pears, plums, and peaches — being trained on horizontal trellises, resembling our grape-vine arbors, seven or eight feet above the ground. In consequence of this method, the fruit hangs under the foliage shaded from the sun and is always devoid of flavor and sweetness. The Japanese, too, gather their fruit before it ripens, the result being that it is impossible to obtain ripe, sweet, well-flavored fruit in the country, and the traveller, having the sour stuff daily thrust before him, ultimately acquires, as did the late Robert Fortune, a taste for it. Even muskmelons are gathered and eaten long before coming to maturity; if the people would boil them, as they do cucumbers, they doubtless would be less harmful.

The most impressive forestry in Japan is found at Nikko, the splendid Cryptomerias surrounding the temples and tombs of Nikko and lining the road to Tokyo as far down as Utsonomiya, a distance of twenty-five miles. These trees were planted in the seventeenth century, when the body of Ieyasu, the founder of the Shogun dynasty, was removed to Nikko. The daimyos were called upon to furnish a stone lantern each to light the grounds about the great ruler's tomb, and one too poor to comply offered to plant trees by the roadside to protect visitors from the sun; he accordingly planted these Cryptomerias, whose solemn grandeur, together with the fine mountain scenery and wonderful cascades, have called for the proverb, "Let no one use the word 'magnificent' till he has seen Nikko." The grandeur of the beautifully lacquered and gilded temples does not eclipse that of nature here. The mountains, the streams, and the waterfalls are indeed magnificent. At the time of my visit I found many of these mountain-

sides densely covered with the dark green foliage and bright blue blossoms of *Hydrangea vestita*, particularly the rocky sides of the canyons, where they were watered by the spray of the waterfalls.

Of the many shrubs found in these mountains, *Hydrangea paniculata* was at the time of my visit the most conspicuous, because it was in full bloom. I picked flowers of *Hydrangea vestita*, *Lycoris squamigera*, *Anemopsis macrophylla*, *Epilobium spicatum*, *Clematis apiifolia*, *Campanula punctata*, *Adenophora latifolia*, *Scabiosa Japonica*, *Lespedeza bicolor*, *Patrinia hispida*, *P. scabiosæfolia*, *P. officinalis*, *Salvia Japonica*, *Primula Japonica*, *Aster scaber*, *Veronica longifolia*, and *Commelina nudiflora*.

As I have said, Japan has given us many beautiful plants particularly adapted to our climate, that of Japan being not unlike that of New England. It is somewhat hotter in summer and not as cold in winter, with much more rainfall and considerable snow.

In the practice of horticulture generally, the people are far behind us, and the results in several branches in which they excel, as in dwarfing plants, curious grafting, and fantastic training, are unworthy of the labor bestowed.

Japan will be helpful to us in supplying lilies, irises, and pæonies, which on account of climate and cheap labor she can produce advantageously, but I do not believe she will become a serious rival to American or European nurserymen, as has been feared.

The lecture was illustrated with numerous beautiful stereopticon views, which added greatly to its interest. At the close, on motion of Joseph H. Woodford, it was voted that the thanks of the Society be presented to Mr. Farquhar for his very interesting exhibition and lecture.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, March 25, 1899.

A meeting for Lecture and Discussion was holden today at eleven o'clock, Vice-President BENJAMIN P. WARE presiding.

The following lecture was delivered:

Roadside Treatment: Actual and Possible.

By Mrs. F. H. Tucker, Newton.

As it was by your Forestry Committee that I was asked to speak to you today I should have preferred to speak upon some phase of forestry proper, and should have done so had I not been sure that I could bring you no phase of the subject with which you were not quite as familiar as I. Besides, I happened just at that time to be especially interested in what seemed to me some almost unconsidered features of roadside treatment, and as it is out of the abundance of the heart that the mouth is apt to speak to the best purpose, I venture to bring you this subject today. I do not come, however, mainly for the purpose of giving you information or facts which you doubtless already possess, but rather to bring you the problems and suggestions which the facts have brought to me, hoping for your aid in a practical solution. I have, in short, an axe to grind, but as it is your axe as much as mine, I trust you will pardon me for bringing it to your grindstone.

Scientific roadside treatment is closely related on the one hand to the science of forestry, and on the other to the science of good roads, but belongs to a more advanced stage of civilization than either. For as long as tree growth is regarded solely as an encumbrance to the ground, to be got rid of as fast as possible, or of value only as measured in terms of cord wood or board feet, and while roads are allowed to remain nearly or quite impassable during large portions of the year, the chief problem being how to pass through them at all, — while these conditions represent the normal standard of a community, one is plainly too far in advance of his times who calls public attention to the beauty or even tries to discuss the utility of any roadside growth. But we in Massachusetts, as well as in many other parts of the country, have passed that primitive stage where we can look with equanimity on indiscriminate destruction of trees and forests, or submit tamely to the inconveniences of bad travelling, or of no traveling at all. arising from bad roads. Many of us are also passing, or have passed, that sentimental stage where one cannot see a tree cut or cut down without a shriek of horror, and the ultra-economic stage when one cannot conscientiously enjoy a good dirt or grass-grown road because of a conviction that every road should be macadamized. No one, indeed, who has not given the subject some atten-

tion can realize the rapid strides which intelligence and common sense have made the past few years among the people at large in altering their views and their standards in respect to trees and roads. Now, with our forest and park reservations, our schools and chairs of arboriculture, and the greater or less influence of Arbor Day, our forestry associations, and the literature and general influence and information disseminated by all these forces; with our Highway Commission and the more than two hundred miles of State roads and the many more miles of first-class town and country roads due to this State object lesson and to the earnest efforts and coöperation of the League of American Wheelmen, — with all this pioneer work we are surely ready to begin what has never yet been attempted, a general systematic and artistic treatment of the roadsides, the connecting link between road-making and forestry.

There is at present apparently no science or art or system of roadside treatment. There are a few traditional notions on the subject and a body of more or less thoughtful and intelligent but haphazard opinion and practice; but this opinion and practice are so varied that it is doubtful whether any two persons who had given thought to the matter would agree on any five of the dozen or so principal points of variance.

In this discussion we shall confine ourselves almost entirely to country roadsides, noticing suburban roads and parkways only incidentally, and shall try to answer three questions:

I. What is the actual condition and treatment of our New England roadsides, and what principles, if any, underlie this treatment?

II. What constitutes — or would constitute if we had it — a treatment at once artistic and practical; in other words, in the broadest sense scientific; that is, founded on knowledge of conditions and of ends to be served and the best means of attaining those ends?

III. How may such scientific treatment be attained?

First, as to actual conditions and treatment and the principles thereof.

Without doubt the rural New England population, both as towns and as individuals, generally answer the question, "Shall we allow or encourage anything except grass to grow beside the road?" by an emphatic, "We will not." I have tried to find out the reasons

for this almost universal opposition to roadside growth, and will give you the results of my investigation:

1. *Conservatism.* — Many farmers keep the roadsides close cut for no tangible reason whatever, except that they and their neighbors and their ancestors have always regarded it as the proper thing to do. The most casual observer driving through country roads can hardly fail to be struck with what seem to be two opposite tendencies in the treatment of the roadside. One is to make a clean sweep of everything that grows. So far from planting trees or anything else, there seems to be a special spite against every scrap of vegetation, and all growth, whether a blade of grass, a daisy, a fern, raspberry, alder, or seedling oak or maple, — everything is periodically clipped as close as scythe can cut it. The other is the let-alone tendency. On roads where this prevails there is no more attempt at tree-planting than in the other case, but neither is there care or effort of any kind, and all sorts of growth flourish wildly luxuriant, — so luxuriant, indeed, as often to interfere rather seriously with the traveller's hat or carriage-top. In many parts of New England the latter tendency seems to be rapidly gaining ground in spite of the forces of conservatism. I account for this by the decay of agriculture and abandonment of many farms and consequent partial disuse of some of the roads in almost every town, and also by the fact that many farms are taken by foreigners without New England traditions in the matter.

2. *Untidiness.* — The New England love of order and tidiness led the old-time farmer to look upon roadside "bushes and weeds" as untidy, and to "clean up" the sides of the road just as his wife swept her floors and arranged the chairs in straight rows against the walls, and the conservatism just mentioned has kept him and his descendants doing the same thing ever since. A farmer who did not keep his roadsides "clean" was looked at askance as "shiftless" and more or less unthrifty, whatever redeeming traits he might display.

3. *Tramps.* — I have been told that the greatest objection to roadside shrubbery is that it harbors and encourages tramps. This cannot, however, be taken too seriously. The same objection might be made to building barns.

4. *Shade.* — Roadside trees beside cultivated fields are opposed on the ground that they shade the crops, and also because of the nourishment which they withdraw from the soil at the expense of the crops.

5. *Seeds.* — Another objection urged against roadside growth is that harmful seeds are thereby propagated which are scattered over neighboring fields, thus producing weeds which are a pest to the farmer.

6. *Insects.* — Roadside growth is opposed also as the breeding place of many insect pests injurious to crops.

7. *Grass.* — Some farmers wish to utilize their roadsides for grass, which they cut as an addition to their hay crop, and so oppose any growth which interferes with this end.

8. *Dust.* — It is objected from an æsthetic point of view that dust from the highway settles so heavily upon wayside shrubs and plants as to make them unsightly and disagreeable, whatever beauty they might otherwise possess.

9. *Cutting off View and Breeze.* — For æsthetic reasons, also, tall bushes are opposed as cutting off the view both near and distant, as well as shutting out the breeze, thus making the road hot and uncomfortable.

10. *Dampness.* — Trees and tall shrubs are discouraged by some on the ground that by their shade they prevent mud from drying, and in some localities keep the road generally damp.

11. *Drifting of Snow.* — This is by far the most serious objection raised to roadside trees and shrubs, but there is the greatest possible difference of opinion even among the most strenuous objectors as to what constitutes right or permissible conditions in the matter. The most radical declare that all trees, bushes, and plants of every kind on every road should be cut off regardless of location; others assert that only certain kinds of trees cause drifting; some that trees trimmed high do not affect drifting conditions; others that they should be trimmed low; many say that trees do no harm, but all other growth should be cut off. Some insist that any growth on the north or east side of the road is protective; others say that both sides should be kept cut or both shaded. These are but a few of the many points of dispute connected with this branch of the subject.

II. In view of all these arguments against roadside adornment our second question: What would constitute a treatment both practical and artistic? may seem rather difficult to answer. But let us first ask just what we should like to have if we could get it regardless of objections, and then see if meeting those objections might not be the very method, or one method, of obtaining our object.

And, first, the negative side, What must we *not* have? We must not have rubbish or gravel heaps beside the road. Even remote country roadsides should never be used, as is often the case, for a dumping-ground, and gravel or stone left from road-mending should be disposed of otherwise than in unsightly heaps by the roadside.

Banks from which sand, gravel, or dirt is dug for repairing the road should not, if possible to avoid it, be left in such condition as to disfigure the roadside.

Telephone poles should wherever possible be set at a sufficient distance from the road to be invisible to passers-by. This is already done to a small extent in some towns.

Fences and walls should be made as unobtrusive or otherwise as artistic as can be. Board fences are a disfigurement to the highway, besides being objectionable under certain conditions as causing snowdrifts. Many object to walls on the same account. Wire fences, — not barbed wire, — where something better can be substituted for the ugly posts, are as harmless as anything. In some places efforts are made to do away with fences altogether, leaving field and wood wholly open to the road. Artistically, this is perhaps the most desirable plan of all, though low walls, or ruined walls, often have a beauty peculiarly their own.

Poison Ivy is a pest which should nowhere be tolerated, and the carelessness which allows it to flourish in profusion on so many of our Massachusetts roadsides is a disgrace to the boasted civilization of this State. There are evils enough that no legislation can cure or even mitigate, but on this matter State laws could surely be made and enforced which should within two or three years at longest rid the country of this wholly unnecessary plague. I have never until lately heard of any reason or excuse, except apathy or inertia, for the perpetuation of such a nuisance, but it has just been suggested to me that some land owners allow it to overrun their walls and fences in order to keep trespassers off their ground. Whatever the cause, stringent measures should be taken for its extermination.

But now for the positive side, What should we like to have, if we could get just what we wanted?

First, let us have *only* our own native vegetation, including those few species, like Lombardy poplars, so closely associated with New England life and history as to seem at least adopted children of

the soil. I have seen the suggestion that our country roadsides should be planted with foreign shrubs and plants, especially some Japanese varieties. Lovely as these are, however, I should be extremely sorry to see this done. The whole world is growing too nearly alike, anyway. Let us keep what distinctive features we can and preserve at least that individuality of nature which is so dear to the heart of every true New Englander and which is nowhere else more characteristic than in the foliage and blossoms of our roadsides. But I would suggest the free use of as many beautiful foreign plants as possible along some of our suburban roads, replacing them by the native growth as suburb merges into country. This treatment if not overdone would appeal to me as especially beautiful and fitting and therefore artistic, with the foreign, artificially cultivated plants accompanying the more artificial human life and gradually giving place to the native growth along with changing environment.

And next let us have within these limits all possible variety. Our roadsides are now too often either monotonously bare or monotonously overgrown. And we should not choose, even if we could, to line every highway with endless rows of trees, or endless anything else, however beautiful in itself. Almost all our trees, shrubs, and plants are beautiful and suitable when fittingly placed, and an intelligent, artistic study of conditions would suggest that infinite variety of treatment through which our roadsides might yield perpetual because ever-varying charm. How to apply such treatment can perhaps best be suggested by considering those objections, many of them very real, which are raised against roadside growth. Just a word upon each.

Conservatism and a false standard of tidiness can, of course, best be met by showing with object lessons a more excellent way. The tramp question can be better discussed from a sociological than an arboricultural point of view.

The injury done by trees and bushes in shading crops or in robbing the soil of nourishment is often a question of location or of species. On the south side of a road, for instance, trees or bushes will not cast enough shade to be harmful upon fields on either side, and the amount of nourishment taken from crops depends largely upon the kind of trees or bushes in question. It must also be remembered that much nourishment is returned to the ground by fallen leaves. And again, when harm is actually

done in these ways it is often very small indeed or is more than made even by compensating advantages. So I should say, plant or encourage such trees and shrubs as are otherwise desirable where they will not shade crops, and such species as will not rob the soil, or choose locations where on the whole they will be more useful and beautiful than mischievous.

The number of roadside plants that really do much harm by scattering noxious seeds is comparatively small. Seeds are much more apt to be propagated in large numbers from field to roadside, but beautiful plants which really do this injury should be allowed only in places where they will do no harm, or the flowers should be cut before the seeds mature.

Insect pests ought, of course, to be everywhere and always as far as possible exterminated, even, as a last resort, by destroying the trees or shrubs on which they flourish. But as in the case of injurious seeds, the damage of this sort arising from roadside growth is small, compared with what is allowed to go on often wholly unchecked on land adjoining the highway.

Some farmers wish to cut grass from their roadsides, and in the main there is no good reason why they should not do so. For, while we should not wish to see all roadsides cut close, it is in the interest of the very variety that we are seeking, to allow some of them to be kept simply grass-grown. The chief objection against permitting them to be mowed is the unsightliness of the stubble, but as this is quickly covered by the second growth, and as in our present stage of progress insistence on more refined treatment is not yet feasible, we may well wink at these slight blemishes, especially as the farmers who care to harvest their roadsides are comparatively few.

For the disfiguring dust on roadside plants there seems to be no adequate remedy in sight. On all roads, whether dirt or macadam, paved or concreted, on the Back Bay or the Berkshire Hills, the dust fiend reigns at times almost supreme. But let us not destroy our plants or our houses because dust covers them as with a mantle, but rather let us seek the remedy, for one must somewhere sometime be found.

Tall, thick bushes and low-trimmed trees do shut out in some localities both breeze and landscape, but trees may be trimmed high, and bushes thinned or allowed to grow only in clumps wherever an unobstructed view or breeze is desirable and possible.

Luxuriant hedges of alder or willow, with or without the adornment of clematis or other vines, are often very effective for short distances, and places for them can be found where they will not interfere with the comfort or pleasure of the traveller. A chronically damp or muddy road needs more radical treatment than cutting down the trees and bushes on its sides, though too much shade is, of course, undesirable. Dampness and mud show a "springy" soil or defective drainage, and such roads should be replaced by different or better ones.

The alleged influence of trees and bushes in causing snowdrifts is, as has been said, the most serious objection to be met — almost equally serious, indeed, for the time, whether it exists in fact or chiefly in the mind of the objector. Only long and patient study of local conditions — conditions varying with every locality and often with every half-dozen rods on the same road — such study and investigation only can solve the problem. Meanwhile, there are many roads or stretches of road in every town where the snow never drifts to any extent and where roadsides can be beautified without considering this troublesome factor.

By this time it can readily be seen from even these brief observations that one seeking to foster roadside growth must necessarily employ some variety of treatment to meet varying conditions. But the roadside artist will not confine himself to the narrow suggestions of necessity. For instance, when local conditions forbid shrubbery, grass or barrenness are not the only alternatives. The roadside may be seeded for a distance in white clover with delightful effect. Farther on let the grass be filled with violets and perhaps next adorned with the delicate beauty of innocence or bluets, a much neglected flower. Blueberry bushes and sweet fern, hardhack and queen of the meadow, asters and golden-rod, buttercups and daisies, brakes and ferns, make only a beginning of the possibilities of beauty, employed separately or in such combinations as taste or the season may permit. And again; at present, when bushes are to be cut everything else goes with them, whether seedling trees or flowering plants. That is easier than to use care and selection. Now, I have seen it estimated that the cost of planting roadside trees, including care as long as needful, averages about six hundred dollars per mile. But why not sometimes utilize the spontaneous growth? Why should roadside trees *always* stand in rows rather than in groups or irregularly as they

chance to take root. By fostering the natural seedling growth with taste and discretion, might not expense sometimes be lessened and more artistic effects be produced?

It would also seem that a greater variety of trees might be used to advantage for roadside planting. The effect of different outlines and foliage, with a turn in the road or break in the landscape, is very pleasing. The objections commonly made to nut and fruit trees and to pines and other evergreens along highways are not insurmountable and might be more than counterbalanced by their advantages. In short, I believe that no one has ever yet imagined half the possibilities of beauty and variety in our native trees and shrubs and humble wayside plants — a beauty and variety to be obtained not so much by cultivation or artificial treatment of any sort as by skilful and sympathetic direction of Nature's own profusion and combinations. As in forestry, not planting but judicious cutting and pruning is the keynote of success. Let Nature produce and man direct the production. Thus, when consistent with local conditions, let some of the "cleaned up" roadsides grow in as Nature wills, and then thin out and supplement and direct according to taste. Most wayside bushes attain their growth in five or six years, and can thus be experimented on at a much less cost of time and care than trees.

All these are merely suggestions, and but a tithe of those possible to be made, the value of which only investigation and experiment can prove. And this brings us to our last question:

III. How may systematic and artistic roadside treatment be attained? When and how shall we begin to educate, and who will undertake the work of experiment and investigation? First, something may be done directly with and by the farmers. They have much more interest in the subject than might be supposed, and some are doing aggressive and even original work in this line. But most would not know what to do or how to set about it if they wished. Nearly all talk on the matter with much intelligence and respond to questions with valuable opinions and information. As a result of consultations with a number of farmers in different parts of New England I have almost wholly revised the opinions with which I began this study of conditions and methods of treatment. When farmers, as well as other people, find their own opinions sought for and prized they are much more ready to listen to those of others and to act upon them than when approached

dogmatically. For example, the beauty of roadside "brush" is almost wholly unappreciated in the country. Most farmers do not greatly object to trees that cost them no care or trouble, especially if trimmed high, and roadside plants are thought merely untidy. But bushes are regarded as wholly a nuisance. City boarders, however, have done something toward teaching the beauty of hedges or clumps of barberry, thickets of raspberry and blackberry, and rows or groupings of sumac, alder, willow, cherry, mulberry, elderberry, and many other shrubs. When it is found that such things pay they are looked at in a new light; first, perhaps, with curiosity and then with real appreciation. Many instances might be given of genuinely beautiful and educative work done by or through the influence of these boarders or summer residents, such as buying or saving strips of roadside woodland, planting or preserving trees, shrubs, and vines, and in other ways. But such results are almost infinitely small compared with what remains to learn and to do. One valuable principle is, however, illustrated; namely, that all reforms, even reform of the country itself, must proceed from the city and work outward. Moreover, trained and organized effort is necessary to produce the desired result — a treatment, that is, at once general, systematic, scientific, and beautiful. To what organization can we look? It seems to me that in this State the Massachusetts Highway Commission is the best equipped for study and investigation along these lines. They have already many miles of State road under their supervision to which they are adding other miles every year. This Commission has already nearly or quite all the authority and discretion necessary for such an undertaking in the statutes requiring it to "keep all State roads reasonably clear of brush," and to "cause suitable shade trees to be set out along said highways when feasible," and to "renew the same when necessary," besides "cutting the weeds along the roadway." The Massachusetts Forestry Association also and the Horticultural Society could find many ways to assist and advise in making our country roads beautiful without being unpractical. Village improvement societies, road commissioners, and every other agency should as far as may be act in harmony with and under the advice of the State Highway Commission, which has from its scope and equipment the best possible opportunity of making its roads object lessons for the study of conditions and for every variety of treat-

ment. No one official is of more importance in such a movement than the tree warden, especially when every town shall have that officer, and occasional conferences of all the tree wardens of the State, perhaps including the firewards, would be most valuable for comparing notes and discussing facts and methods.

But all effort, great or small, whether undertaken by individual or town or by organizations, either State or voluntary, should have for its motto, Scientific and Artistic Treatment in Accordance with Local Conditions.

Discussion.

The Chairman said that the lecturer had opened a wide field for discussion. She had answered many of the difficulties brought up when roadside improvement is urged. Farmers who have a mile of road by their land find it difficult to make both ends meet, and especially to pay their taxes. Towns would be unwilling to make appropriations for roadside improvement, because they have not been educated to it; but Mrs. Tucker would make a good missionary to educate them. In gathering autumn leaves the poison ivy should be avoided, and it ought to be eradicated. We want to create a popular sentiment in favor of roadside improvement, and there are ladies and gentlemen at this meeting who could carry home a powerful influence for its advancement.

Mrs. Tucker said that the expense of roadside improvement had been spoken of, but this would not be great. In one location that she knew of, very pleasant results were produced by planning the work systematically, and using our own native shrubs. It is not rare foreign plants that are needed, or large sums of money, so much as good taste and a desire to improve the appearance of the roadside.

O. B. Hadwen said that he had a fondness for roadside improvement, but he had changed his opinion somewhat, and now thinks that no trees should be set where there is much traffic; horses, electric-light men, and highway surveyors have no fondness for trees. He would plant his trees inside the fence, so as to retain control over them. A great variety of trees can be grown on a country road where the objections mentioned do not exist. In some country towns, from the sidewalk to the roadway there is a wide strip of grass for miles, which is cut with a lawn-mower, and one feels in passing through such a street that he is in a section of great refinement.

In Worcester, where the speaker resides, the Parks Commission have control of all street trees, and plant eight hundred a year; but they begin after a few years to show indications of neglect. They are planted seven feet from the fence. Trees weighted with ice bend over into the street and have to be cut off. People advise land owners to let the forest grow, but the speaker is coming to the conclusion that the only way is for the Commonwealth or towns to undertake it.

Mrs. Tucker wanted to say a word in favor of white pines. She knew a row of these trees, about thirty feet high, on the north side of a road, opposite the residence of the owner, and though they injure the grass somewhat, they shelter the house, and every tree has saved him a cord of wood. A wealthy man bought a strip of woodland three rods wide on each side of a road to save the trees, but was not very successful; as soon as the trees lost the support of the others the largest blew down, but the experiment may yet be successful. In a place sheltered by hills another attempt succeeded. If the expense of setting out trees is six hundred dollars per mile, it does not cost so much to preserve trees already there. Professor Fernow says that the planting tools are not so much needed.

Mr. Hadwen said that he planted a row of white pines in 1846, which are now seventy or eighty feet high, and afford good sawlogs. The ice we have had for some time past in winter has broken them badly; they are the worst of all evergreens to withstand breaking by ice, and the Norway spruce is one of the best.

James H. Bowditch was surprised that Mr. Hadwen should advocate the Norway spruce in preference to the white pine. Street trees must be trimmed up, and the beauty of the Norway spruce is destroyed the moment you trim it up. Mr. Hadwen's white pines, planted more than fifty years ago, have got through a good deal, and the speaker thought that Mr. Hadwen's objections to the white pine were answered by his own trees. Mr. Vanderbilt, at Biltmore, offers seedling white pines, four feet high and transplanted, for $10.50 per thousand.

The Chairman said that there are many country roads where it would involve great expense to do anything effectual; there are instances in his vicinity. Clematis vines growing over barberry bushes by the side of the road cover up the coarseness of the land, and become things of beauty. There are many places where the

let-alone system would be best and most beautiful, and many places where the trees and shrubs might be trimmed and improved; but who is to do it? It will require a good deal of preaching to bring about public sentiment to the improvements suggested by the lecturer.

—— Nowell agreed with Mr. Hadwen that much injury is done to trees by electric-light men, boys, etc., and said that a bill was then before the Legislature providing for the appointment of tree wardens, who should have sole charge of all trees in streets. He suggested that the audience should exercise their influence in favor of the preservation of street trees from injury.

J. W. Manning spoke of a row of white pine trees in Manchester, N.H., on the river road, about two miles below the city, in that part which was formerly Bedford. They are trimmed up, but they look well. He had something to do with planting them; he dug up small trees where a wood lot had been cut off. They were planted four or five feet inside of the owner's land for a distance of seventy-five rods. Many of them lived, and are now from twenty to forty feet high.

EXPERIMENT STATION REPORTS WANTED.

The Massachusetts Horticultural Society is endeavoring to make complete its sets of the Bulletins and other publications of all the Agricultural Experiment Stations in the United States and Canada. Those named below are wanting, and any person having a spare copy will confer a favor by addressing the Librarian of the Society, Horticultural Hall, No. 101 Tremont Street, Boston.

Alabama (Ag. and Mech. College Station). — Bulletins 4–6 (1884), 7–10 and 1–4 (1885), and 5–9 (1886). 7th Annual Report, for 1894, and 9th, for 1896.

Alabama (Canebrake Station). — All Bulletins later than 18, and all Annual Reports later than the 3d, for 1890.

Arizona. — 4th Annual Report, for 1893.

Arkansas. — Bulletin 1. All Annual Reports later than the 4th, for 1891, except the 8th, for 1895.

California. — Bulletins 32, 1878, and 1, 2, 3, and 50, New Series.

Colorado. — Bulletin 3.

Connecticut (New Haven Station). — Bulletins 1 to 67, inclusive. Annual Reports for 1877 to 1883, inclusive, except that for 1878.

Florida. — Annual Reports for 1891 and 1892.

Indiana (Purdue Univ. School of Ag.). — Bulletin 1. College Reports 1–14, inclusive.

Kentucky. — Bulletin 10.

Michigan. — Special Bulletins 1, 3, and 5. 6th Annual Report, for 1892–93. (Contained in Report of Michigan Board of Agriculture, 1893.)

Missouri. — Bulletins 9, 13, 15, 16, 19, 20, 25, 26, and 33 of Old Series. All Annual Reports since the 1st, for 1888, except those for 1896 and 1897.

New Jersey. — Bulletins 1, 4, 5, 15, 27, and 28.

New York (Cornell). — Annual Report, 1882–83 (Report of Agricultural Department of Cornell University).

North Carolina. — Bulletins 1 to 56, inclusive. 1st to 7th Biennial Reports. Meteorological Division, Bulletin 2 (68*b*). Special Bulletins 1 (77*a*) and 4 (82*a*). Weekly Weather Crop Bulletins 1–21, 1888; 1–24, 1889; 1–25, 1890; 2 and 4, 1891.

North Dakota. — 4th Annual Report, for 1893

Ohio. — All Bulletins of First Series, except 16, 17, 18, and 19.

Pennsylvania. — Annual Reports for 1869, 1872, 1879–80, 1881, 1882, 1883, and 1884. [All issued by the State College.] Bulletin of Information No 1.

South Carolina. — All Bulletins of the Old Series (previous to 1888) on the work of the Experimental Farm of the South Carolina College. 3d Annual Report, for 1890, 6th, for 1893, and 9th, for 1896.

Texas. — College Bulletins 1–5, 1883–1887.

Washington. — 6th, 7th, and 8th Annual Reports, for 1895–96, 1896–97, and 1897–98 All Bulletins later than 27

West Virginia. — Special Bulletin — Potash and Paying Crops, 1890.

Wyoming. — Bulletins 2 to 4, 9, and 10.

Ontario Department of Agriculture, Toronto. — Bureau of Industries. — Agricultural Returns to the Ontario Bureau of Industries, Nov. 1882 (5th), Aug. 1883 (7th), and Nov. 1887 (20th).

Experiment Stat

TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1899.

PART II.

BOSTON:
PRINTED FOR THE SOCIETY.
1900.

☞SEE LAST PAGE OF COVER.

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1900.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society

BUSINESS MEETING.

SATURDAY, April 1, 1899.

A duly notified stated meeting of the Society was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

The recommendation of the Executive Committee that the Society appropriate $80 for the use of the Garden Committee for the year 1898, additional to the appropriation for that year, reported to the Society at the meeting on the 4th of February, and then accepted, came up for final action and was unanimously voted.

The Executive Committee reported a recommendation that the Society appropriate $150 for the use of the Committee on Forestry and Roadside Improvement for the year 1899. The report was accepted and the appropriation was unanimously voted.

The Executive Committee recommended the election of William Salway, Superintendent of Spring Grove Cemetery, Cincinnati, Ohio, as a Corresponding Member, and he was unanimously elected.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were upon ballot duly elected:

MRS. ISABELLA STEWART GARDNER, of Boston.
GEORGE P. HAYWARD, of Roxbury.
H. R. KINNEY, of Worcester.
DR. BEN H. METCALF, of Winthrop.
HORACE H. MOSES, of Roxbury.
MICHAEL SULLIVAN, of Revere.

Joseph H. Woodford, at the request of the Committee on Plants, announced the decease of Azell C. Bowditch, Chairman of that Committee, and moved the election of William Wallace Lunt as Chairman, and Mr. Lunt was unanimously elected.

Mr. Woodford further moved that the Committee on Plants be empowered to select a member to fill the vacancy in the Committee and report the same to the Society, and this vote also was passed.

Mr. Woodford brought up the subject of the selection of a site for a new building for the Society, and advocated the purchase of a lot on the corner of Huntington Avenue and Oxford Terrace, explaining his views by the aid of a plan of the locality. The subject was discussed by Benjamin P. Ware, William E. Endicott, and Rev. Calvin Terry, and President Appleton made a statement explanatory of the subject.

Mr. Woodford moved that the selection of a site be left to the Executive Committee.

George D. Moore moved as an amendment that the Committee on Building take into consideration rebuilding on the present site and the purchase of land in the rear.

Pending the discussion of these motions, the Society, on motion of Benjamin C. Clark,

Adjourned to Saturday, May 6.

BUSINESS MEETING.

SATURDAY, April 22, 1899.

A special meeting of the Massachusetts Horticultural Society was holden at ten o'clock today, in accordance with the following request:

BOSTON, April 12, 1899.

Francis H. Appleton, Esq.,
President of the Massachusetts
Horticultural Society, Boston, Mass.

DEAR SIR: The undersigned, members of the Society, respectfully petition that a meeting be called at as early a date as is practicable, to listen to a report of the Finance and Executive

Committees, and to see whether the Society will authorize and direct the Finance Committee to purchase the lot of land on the corner of Huntington and Massachusetts Avenues, and extending to Falmouth Street, opposite the new Music Hall, and to authorize the President to appoint a committee of five with power to erect a new horticultural building thereon; also to authorize the Finance Committee to mortgage any of the Society's property in order to complete the purchase of said new lot of land, and the erection of said new horticultural building; and to authorize the Finance Committee to sell or improve the Society's real estate on Tremont Street as the said Finance Committee shall deem best; and to take any further action that may be necessary.

WALTER HUNNEWELL,	FRANCIS H. APPLETON,
CHARLES W. PARKER,	H. H. HUNNEWELL,
CHARLES S. SARGENT,	WILLIAM C. STRONG,
HENRY P. WALCOTT,	WILLIAM H. SPOONER,
SOLOMON LINCOLN,	NATHANIEL T. KIDDER,
C. E. RICHARDSON,	BENJAMIN C. CLARK,
BENJAMIN M. WATSON,	CHARLES F. CURTIS,

AUGUSTUS HEMENWAY.

In compliance with this request, agreeably to Section XII of the Constitution and By-Laws, the following notice was sent to every member of the Society:

MASSACHUSETTS HORTICULTURAL SOCIETY,

BOSTON, April 12, 1899.

Pursuant to the provisions of the Constitution and By-Laws, at the request of twelve members of the Society, the President hereby calls a special meeting of the Society, to be held at Horticultural Hall, 101 Tremont Street, Boston, on Saturday, the twenty-second day of April, 1899, at ten o'clock in the morning, to listen to a report of the Finance and Executive Committees, and to see whether the Society will authorize and direct the Finance Committee to purchase the lot of land on the corner of Huntington and Massachusetts Avenues and extending to Falmouth Street, opposite the new Music Hall, and to authorize the President to appoint a committee of five with power to erect a new horticultural building thereon; also to authorize the Finance Committee to mortgage any of the Society's property in order to

complete the purchase of said new lot of land and the erection of said new horticultural building; and to authorize the Finance Committee to sell or improve the Society's real estate on Tremont Street, as the said Finance Committee shall deem best; and to take any further action that may be necessary.

FRANCIS H. APPLETON,
President Massachusetts Horticultural Society.

ROBERT MANNING,
Secretary.

At this meeting the President was in the Chair. The call for the meeting was read by the Secretary.

Benjamin C. Clark introduced the subject by speaking in favor of the purchase of land on the corner of Huntington and Massachusetts Avenues as recommended by the Finance and Executive Committees.

Col. Solomon Lincoln moved the adoption of the following votes, and spoke in support of his motion:

Voted, That the Finance Committee be authorized to purchase, at such price as may seem to them suitable, the lot of land at the corner of Massachusetts and Huntington Avenues, in this city, comprising about twenty-two thousand five hundred square feet, for the use of the Society.

Voted, That the Finance Committee be authorized to sell or improve the Society's real estate on Tremont Street as the said Finance Committee shall deem for the best interests of the Society, and to mortgage any of the Society's property for such purposes, or in order to carry out the vote of the Society to purchase a piece of land at the corner of Massachusetts and Huntington Avenues.

Voted, That the President shall appoint a committee of five members, of which he shall be the chairman, with full powers to erect a building at the corner of Massachusetts and Huntington Avenues for the use of the Society at a cost not exceeding two hundred and twenty-five thousand dollars.

On motion of J. D. W. French it was voted that the speakers be limited to five minutes except with the consent of the meeting.

It was voted that the polls be kept open from eleven o'clock to one, provided that a vote is not previously reached.

The following Committee was appointed to receive, sort, and count the votes:

BENJAMIN M. WATSON, *Chairman.*

J. ALLEN CROSBY,	MISS MARY C. HEWETT,
CHARLES W. JENKS,	HENRY S. ADAMS.

The polls were opened at eleven o'clock, and remained open until one o'clock. The Committee to receive, sort, and count the votes, at the close of the ballot, reported that on each vote two hundred and fifty-seven members voted in the affirmative, and seventy-seven in the negative.

The President then declared that all the votes were passed, and that the second vote was passed by an affirmative vote of more than two-thirds of the members of the Society present and voting at this meeting.

The President said that he would announce the names of the Committee provided for in the third vote through the press.

Adjourned.

BUSINESS MEETING.

SATURDAY, May 6, 1899.

An adjourned meeting of the Society was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

The President announced the following as the Building Committee appointed by him agreeably to the vote passed at the Special Meeting of the Society on the twenty-second day of April:

President FRANCIS H. APPLETON, *Chairman* (as provided in the above mentioned vote).

CHARLES F. CURTIS,	CHARLES S. SARGENT,
GEORGE A. NICKERSON,	WILLIAM J. STEWART.

and that the Committee had chosen William J. Stewart, Secretary, and Edmund M. Wheelwright, Architect.

William Wallace Lunt, Chairman of the Committee on Plants, reported that that Committee had selected to fill the vacancy thereon, agreeably to the vote of the Society, Robert Cameron.

The President spoke of the decease of Waldo O. Ross, formerly Chairman of the Library Committee, and Azell C. Bowditch, Chairman of the Committee on Plants, and it was voted that Committees be appointed by the Chair to prepare memorials of these members. The Chair appointed to prepare a memorial of Mr Ross, William E. Endicott, George E. Davenport, and George W. Humphrey.

And to prepare a memorial of Mr. Bowditch, William Wallace Lunt, C. H. B. Breck, and Arthur H. Fewkes.

The Secretary announced the decease on the 19th of March, in his eighty-fourth year, of Charles Naudin, Director of the Experimental Garden at the Villa Thuret, Antibes, France, one of the most distinguished gardener-botanists of our times, of whom the "Gardeners' Chronicle" said that "though to the rank and file of gardeners his name might not be familiar, those concerned with the problems of systematic botany, hybridization, experimental cultivation, and the acclimatization and distribution of economic plants, would recognize that a mighty leader had fallen." He was elected a Corresponding Member of this Society in 1887, and several of his works are in the Library. The Secretary did not propose any action in regard to the death of M. Naudin, but thought it due to the Society that the departure of so eminent a member should not pass unnoticed.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

MARSHALL K. ABBOTT, of Hamilton.
MISS MARY S. AMES, of North Easton.
OLIVER AMES, of North Easton.
REBECCA C. AMES, of North Easton.
CHARLES W. AMORY, of Boston.
GEORGE H. BALL, of Boston.
WALTER C. BAYLIES, of Taunton.
ALBERT S. BIGELOW, of Cohasset.
JOSEPH S. BIGELOW, of Cohasset.
DR. WILLIAM STURGIS BIGELOW, of Boston.
T. DENNIE BOARDMAN, of Boston.
LAWRENCE BROOKS, of Groton.
PETER C. BROOKS, of Boston and Medford.

Shepherd Brooks, of Medford.
John A. Burnham, of Manchester.
Eliot C. Clarke, of Boston.
Hon. George G. Crocker, of Boston.
Charles P. Curtis, of Swampscott.
Edward L. Davis, of Boston and Worcester.
George Dexter, of Beverly.
James L. Duncan, of Chelsea.
William A. Gaston, of Boston.
Edward S. Grew, of Boston.
William Hooper, of Boston.
Horatio A. Lamb, of Milton.
George C. Lee, of Newton (Chestnut Hill).
Abbott Lawrence Lowell, of Boston.
Charles Merriam, of Boston.
John T. Morse, Jr., of Boston.
Henry Parkman, of Boston.
S. Endicott Peabody, of Salem.
Elisha N. Pierce, of Waltham.
Alexander S. Porter, of Boston.
Richard M. Saltonstall, of Newton.
Miss Emily E. Sears, of Boston.
Dr. Henry F. Sears, of Boston.
Francis Shaw, of Wayland.
John Eliot Thayer, of South Lancaster.
William Warren Vaughan, of Boston.
Samuel D. Warren, of Dedham.
Edmund M. Wheelwright, of Boston.

Adjourned to Saturday, June 3.

BUSINESS MEETING.

Saturday, June 3, 1899.

An adjourned meeting of the Society was holden at eleven o'clock today, the President, Francis H. Appleton, in the chair.

William Wallace Lunt, Chairman of the Committee appointed at

the last meeting to prepare a memorial of Azell C. Bowditch, reported the following;

Whereas, God, who doeth all things well, has called from among us our late associate, Azell Carter Bowditch, and

Whereas, In the death of Mr. Bowditch we have lost an able counsellor, an upright judge, and one who has endeared himself to all who have had occasion to make exhibits before the several committees of which he was a valued member.

Resolved, That we hereby express our deep sense of the loss of one of the oldest members of the Society, who inherited from his father, also a member of the Society, a love of horticulture, and who for half a century has labored earnestly for its welfare.

Resolved, That we tender our sincere sympathy to his family in their bereavement.

Resolved, That these resolutions be spread upon the records of the Society, and that a copy of them be sent to the family of the deceased.

WM. WALLACE LUNT,
C. H. B. BRECK,
A. H. FEWKES,
} *Committee.*

The memorial was unanimously adopted.

George E. Davenport, from the Committee appointed at the last meeting to prepare a memorial of Waldo O. Ross, presented the following:

It is with feelings of the deepest regret that we find ourselves called upon to record the death of so valuable a member of this Society as Mr. Waldo O. Ross, who passed away on the 27th of December, 1898, after a brief illness which cut him off from a career of usefulness in the very prime of a splendid manhood. As a member of the Library Committee during the years 1875 to 1878, inclusive, in the last two of which he was chairman, Mr. Ross served this Society well, and his gift to the Library of a fine set of "Nature" attests the character and value of his membership.

Always in touch with the best interests of this Society, and ever ready to serve it to the best of his ability, his loss is greatly to be deplored, while the superb character of his personality and the unaffected simplicity of his manners, which endeared him to all who came in contact with him, make his loss all the greater.

Wherefore, in testimony of the esteem in which he was held by this Society, we place these resolutions on record, and tender a copy of the same to the family of our late brother member.

GEORGE E. DAVENPORT,
For the Committee.

This memorial also was unanimously adopted.

The Secretary announced the decease, on the 11th of May, of Malcolm Dunn, head gardener to the Duke of Buccleuch, at Dalkeith, Scotland, who took this position in 1871, after serving in some of the most noted gardens in England, Scotland, and Ireland, and who, succeeding to such great gardeners as Charles McIntosh and William Thomson, sustained the high level of their reputation at Dalkeith, and the fame of the garden. As a landscape gardener he possessed a good taste and he had also a knowledge of plants and their adaptation to given localities; as a pomologist he had an extensive knowledge of varieties, and his labors in the Caledonian Horticultural Society, the Scottish Horticultural Association, and the Scottish Arboricultural Society, were of the highest importance. He was elected a Corresponding Member of this Society in 1891.

The President announced that John G. Jack had resigned his membership of the Committee on Forestry and Roadside Improvement, and James Sturgis Pray was elected to fill the vacancy.

George E. Davenport, of the Committee on School Gardens, Children's Herbariums, etc., asked for an additional appropriation of $50 for gratuities for native plants. This appropriation was, agreeably to the Constitution and By-Laws, referred to the Executive Committee.

The following named persons, having been recommended by the Executive Committee as Life Members of the Society, were upon ballot duly elected:

SAMUEL N. BROWN, of Boston.
T. JEFFERSON COOLIDGE, JR., of Boston and Manchester.
L. SHANNON DAVIS, of Brookline.
WILLIAM AMORY GARDNER, of Groton.
SAMUEL HENSHAW, of Cambridge.
WILLIAM A. JEFFRIES, of Boston.
DAVID P. KIMBALL, of Boston.

Rt. Rev. William Lawrence, of Boston.
Arthur Lord, of Plymouth.
Charles S. Minot, of Boston.
Col. Charles Pfaff, of South Framingham.
Gen. Stephen M. Weld, of Dedham.

The meeting was then dissolved.

BUSINESS MEETING.

Saturday, July 1, 1899.

A duly notified stated meeting of the Society was holden today at eleven o'clock, the President, Francis H. Appleton, in the chair.

Leverett M. Chase moved that the subject of placing mural tablets on the walls of the building to be erected for the Society, to be inscribed with the names of eminent horticulturists, be referred to the Building Committee. The motion was carried.

Adjourned to Saturday, August 5.

BUSINESS MEETING.

Saturday, August 5, 1899.

An adjourned meeting of the Society was holden today at eleven o'clock, the President, Francis H. Appleton, in the chair.

Agreeably to the Constitution and By-Laws, the President appointed the following named members a Committee to nominate candidates for Officers and Standing Committees for the year 1900:

Henry Parkman, *Chairman*.

Patrick Norton.	Herbert Merriam.
Charles W. Jenks.	John Lawrence.
George A. Nickerson.	Warren H. Heustis.

Ex-President William C. Strong spoke of the meeting of the American Pomological Society, at Philadelphia, on the 7th and 8th of September, at which the Semi-Centennial Anniversary will be

celebrated, and moved that a delegation be appointed to represent the Society at that meeting. The following named members were accordingly appointed:

The President, FRANCIS H. APPLETON, *Chairman.*

WILLIAM C. STRONG,	THOMAS C. THURLOW,
WILLIAM H. SPOONER,	EDWARD B. WILDER,
BENJAMIN G. SMITH,	HON. AARON LOW,
ROBERT MANNING,	CHARLES B. TRAVIS,
SAMUEL B. PARSONS,	E. W. WOOD,
BENJAMIN P. WARE,	CHARLES F. CURTIS,
LEVERETT M. CHASE,	O. B. HADWEN,
JAMES H. CLAPP,	WARREN FENNO,
JACOB W. MANNING,	J. WILLARD HILL,
C. C. SHAW,	SUMNER COOLIDGE,
WILLIAM M. MUNSON,	SAMUEL HARTWELL.

It was voted that the delegation have power to add to their number, and that persons desiring to attend the meeting be requested to hand in their names to the Secretary.

Adjourned to Saturday, September 2.

BUSINESS MEETING.

SATURDAY, September 2, 1899.

An adjourned meeting of the Society was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

The Committee to nominate candidates for Officers and Standing Committees for the next year reported a printed list, which was accepted, and the Committee was continued and requested to nominate candidates in place of any who might decline before the election.

A communication from the Forestry Division of the United States Department of Agriculture, asking information as to what has been done here in the interests of Forestry, was referred to the Committee on Forestry and Roadside Improvement. Communications from the same source, relating to the exhibition of fruit

and other articles at the Paris Exposition of 1900, were referred to the Executive Committee.

A communication from the American Rose Society was laid on the table for the information of members.

William C. Strong announced the arrangements for delegates to the twenty-sixth session of the American Pomological Society at Philadelphia on the 7th and 8th instant.

The President announced the decease of Benjamin G. Smith, and it was voted that a committee of three be appointed by the Chair to prepare a memorial. The Chair appointed as that Committee, Benjamin C. Clark, Theodore H. Tyndale, and Benjamin P. Ware.

The Secretary announced the decease of Henri Leveque de Vilmorin, of Paris, a Corresponding Member of the Society, and the head of the great seed house of Vilmorin, Andrieux, et Cie., founded more than a hundred and fifty years ago. M. Vilmorin's great-grandfather became the head of the firm in 1781. M. Henri Vilmorin was the founder of the Society of French Agriculturists; in 1889 he was elected President of the Botanical Society of France, and at the time of his death was the premier Vice-President of the National Horticultural Society of France. He was the best known figure among the horticulturists of France, and the recognized chief authority on horticulture in that country. He made two visits to this country, when we have had the pleasure of welcoming him to these rooms. He was elected a Corresponding Member of this Society in 1887.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

Mrs. Charles Francis Adams, of South Lincoln.
F. L. Ames, of North Easton.
John Ames, of North Easton.
Francis Bartlett, of Boston and Beverly.
William Carver Bates, of Newton.
Miss Anne Blake, of Brookline.
Mrs. Arthur W. Blake, of Brookline.
John M. Brown, of Belmont.
Arthur T. Cabot, M. D., of Boston.

Zenas Crane, of Dalton.
Charles H. Dalton, of Boston and Beverly.
George A. Draper, of Hopedale.
William C. Endicott, Jr., of Danvers.
H. H. Fay, of Wood's Holl.
Joseph S. Fay, Jr., of Wood's Holl.
L. Carteret Fenno, of Boston.
Daniel S. Ford, of Weston.
Charles H. W. Foster, of Brookline and Marblehead.
John L. Gardner, of Boston.
Jackson E. Hall, of Roxbury.
Edwin B. Haskell, of Auburndale.
Mrs. Augustus Hemenway, of Canton.
Col. Charles A. Hopkins, of Brookline.
George Abbot James, of Nahant.
D. Webster King, of Boston.
John Mason Little, of Boston and Swampscott.
Augustus P. Loring, of Boston and Pride's Crossing.
Mrs. William Caleb Loring, of Pride's Crossing.
William Morrison, of Cohasset.
Mrs. David Nevins, of Methuen.
Mrs. George A. Nickerson, of Dedham.
G. A. Peabody, of Danvers.
Miss Marion W. Peirce, of Topsfield.
Col. Albert A. Pope, of Boston and Cohasset.
James M. Prendergast, of Boston.
George Putnam, of Manchester.
Henry R. Reed, of Jamaica Plain.
Elizabeth P. Rogers, of Peabody.
Jacob C. Rogers, of Peabody.
Mrs. Charles S. Sargent, of Brookline.
William H. Sherman, of Brookline.
Charles D. Sias, of Wenham.
Francis Skinner, Jr., of Boston.
Samuel T. Snow, of Boston and Cohasset.
Col. William D. Sohier, of Beverly.
Hon. Moses T. Stevens, of Andover.
Mrs. Nathaniel Thayer, of Lancaster.
Hermann Thiemann, of Manchester.
George R. White, of Boston.

The meeting was then dissolved.

BUSINESS MEETING.

SATURDAY, October 7, 1899.

A Stated Meeting of the Massachusetts Horticultural Society was holden today at eleven o'clock, being the Annual Meeting for the choice of Officers and Standing Committees, Vice-President Benjamin P. Ware presiding.

The Secretary stated that the meeting had been duly notified to the members of the Society, agreeably to the Constitution and By-Laws.

The following Memorial of Benjamin G. Smith, prepared by a Committee appointed for that purpose at the last meeting of the Society, was read by Benjamin C. Clark, Chairman, and unanimously adopted by a rising vote:

MEMORIAL OF BENJAMIN GREEN SMITH.

Benjamin Green Smith was born in Boston, October 1, 1816, graduated from the Boston English High School in the class of 1830, and died in Cambridge, August 23, 1899, leaving a widow, the daughter of Moses Warren, and one daughter, to mourn an exceptionally devoted and affectionate husband and father.

Mr. Smith retired from business many years ago, his health at that time being in a precarious condition, and he had the rare privilege of realizing fully the dream of his early life, which was the opportunity to engage in scientific and practical horticulture.

His ambition was to grow every variety of fruits and flowers. He had one hundred varieties of Hybrid Perpetual roses. Nothing was too difficult for him to attempt. It was deemed impossible to cultivate the high-bush blueberry, yet Mr. Smith studied the natural conditions of the fruit and energetically undertook what proved to be a great success.

Among his specialties were hardy grapes, of which he had more than sixty varieties. He also raised English gooseberries, currants of all kinds, pears, apples, raspberries, strawberries, and quinces in great variety. His conservatory, forcing house, and cold grapery were models.

Although to his last days interested in all the various activities of the Massachusetts Horticultural Society, of which he was Vice-

President from 1880 to 1891, inclusive, giving his time and influence freely to promote its usefulness, Mr. Smith was also greatly devoted to other associations. For many years he was Treasurer of the American Pomological Society, President of the Massachusetts Agricultural Club, Life Member of the Middlesex Agricultural Society, of the American Forestry Association, Bay State Agricultural Society, and New England Historic Genealogical Society, of the American Association for the Advancement of Science, and Local Secretary of the Audubon Society.

We make as part of this memorial the following obituary of Mr. Smith, written by one of the Committee and taken from the "Boston Transcript," of August 28:

Benjamin G. Smith.

The last summons came quietly and without pain as befitted his peaceful and serene old age. Bright and active to the last, in the full use of all his faculties, with but slight evidence of the marks of advancing years, his departure has left us bereft indeed, consoled only by the remembrance of the character of one whom it was a rare privilege to know.

Many years ago Mr. Smith left the cares and anxieties of active business life and thenceforth devoted himself to the cultivation and enjoyment of his beautiful estate in Cambridge. In this pursuit he was most successful, and it is safe to say that no man was ever more thorough in the work which he so much loved, and it is equally true that no one ever enjoyed more fully the exhibition and distribution of the products of his garden. When fruits and flowers came from his lavish hand there was always something more than their usual taste and perfume; there was the sense of a fine sentiment coming from a sympathetic and noble nature.

Mr. Smith was strongly averse to all display and ostentation. Although during his life he held many positions of honor and responsibility, he was not ambitious except in the highest and noblest sense, and he refused more offices than he ever accepted. He was a man of whom all who knew him intimately will say that if there was a kind, thoughtful, considerate act to be performed he would improve the opportunity with a rare discernment. The

most loving memory of a pure, kindly, loyal, unselfish nature is left to those who knew him best and longest.

"On earth we hear a knell—
Elsewhere there peals a bell
In welcome for a guest,
New to the wondrous quest
Whereof no man on earth
May ever know the birth."

AUGUST 26. B. C. C.

In placing upon the record of this Society its appreciation of the life, character, and services of Mr. Smith, the Secretary is requested to send a copy of this memorial to his family as an expression of our heartfelt sympathy in their bereavement.

BENJAMIN C. CLARK,
THEODORE H. TYNDALE,
BENJAMIN P. WARE,
} *Committee.*

The following memorial of David Nevins, prepared by a Committee appointed for that purpose, was read by the Secretary:

MEMORIAL OF DAVID NEVINS.

In the death of David Nevins this Society and the community in which he lived have lost an enthusiastic lover of nature in whichever department he chose to take up. In the latter years of his life he devoted his leisure time to adorning his beautiful place at South Framingham with trees, shrubs, and flowers; and at frequent times entered the list of exhibitors at some of our most prominent exhibitions with very great success. Besides these successes, however, were those superior personal characteristics which every one coming in contact with him appreciated, and which will always attach to his memory the lasting sentiments of respect and esteem.

Every one receiving his hospitalities and enjoying his beautiful place will long remember the magnetic presence of a man who found his keenest enjoyment in life in sharing his own pleasures with his friends and neighbors.

Herewith we desire to place on the records of our Society our deep sense of the loss which we have sustained by his death.

N. I. BOWDITCH,
J. H. WOODFORD,
J. WOODWARD MANNING,
} *Committee.*

After appropriate remarks by Ex-President William C. Strong, this memorial also was unanimously adopted by a rising vote.

The Chairman read a letter from President Appleton proposing that Section V of the Constitution and By-Laws be amended so as to permit voting by proxy. The proposed amendment was read twice and was discussed by Hon. Virgil C. Gilman, William C. Strong, Benjamin C. Clark, Patrick Norton, and Nathaniel T. Kidder. A motion to lay on the table was negatived.

The question was then put "Shall the proposed amendment be entered on the records for final action at the stated meeting in January next," and on this question the vote was unanimously in the negative.

Agreeably to the Constitution and By-Laws, the Chair appointed Hon. Aaron Low, John K. M. L. Farquhar, and Miss Mary C. Hewett a Committee to receive, assort, and count the votes given for Officers and Standing Committees, and report the number. The polls were opened at forty minutes after eleven and closed at forty minutes past one o'clock, and the Committee reported that the persons named on the ticket presented by the Nominating Committee had a plurality of votes, and were elected.

The report was accepted and the persons named on the above-mentioned ticket were, agreeably to the Constitution and By-Laws, declared by the presiding officer to have a plurality of votes, and to be elected Officers and Standing Committees of the Society for the year 1900.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were upon ballot duly elected:

James B. Ayer, M. D., of Boston.
George N. Black, of Manchester.
Mrs. John L. Bremer, of Manchester.
William B. de las Casas, of Malden.
H. E. Converse, of Malden.
J. Randolph Coolidge, of Chestnut Hill.
Mrs. J. Randolph Coolidge, of Chestnut Hill.
Charles P. Curtis, Jr., of Boston.
George B. Fessenden, of Allston.
Mrs. John C. Gray, of Boston.

Arthur E. Hartshorn, of Worcester.
Mrs. Henry S. Hunnewell, of Wellesley.
Eben D. Jordan, of Boston.
Otis H. Luke, of Brookline.
Mrs. Theodore Lyman, of Brookline.
Mrs. John C. Phillips, of North Beverly.
William Phillips, of North Beverly.
Mrs. Francis W. Sargent, of Wellesley.
Mrs. J. Montgomery Sears, of Southborough.
Mrs. Robert G. Shaw, of Wellesley.
Miss Mabel Simpkins, of Yarmouth.
Charles H. Taylor, of Boston.
Mrs. Alice R. Thayer, of Boston.
Eugene V. R. Thayer, of Lancaster.
Mrs. Eugene V. R. Thayer, of Lancaster.
Mrs. John E. Thayer, of Lancaster.
Nathaniel Thayer, of Boston.
Stephen V. R. Thayer, of Boston.
Henry M. Whitney, of Cohasset.
John Davis Williams, of Boston.
Roger Wolcott, of Milton.

Col. Henry W. Wilson presented a bean plant, grown in pure silex with the addition of soda, but without potash, and moved that the subject be referred to the Committee on Gardens, to make such experiments as they see fit, without expense to the Society. The motion was carried and the subject was so referred.

Adjourned to Saturday, November 4.

BUSINESS MEETING.

Saturday, November 4, 1899.

An adjourned meeting of the Society was holden today at eleven o'clock, the President in the chair.

The amendment to the Constitution and By-Laws, to permit voting by proxy, proposed at the meeting on the first Saturday in October, and then defeated, was brought up again on a motion made by the President to reconsider it. The legality of any action

on this subject at this time was questioned and the Chair decided that it was legal. This decision was appealed from, and on putting the question to vote the Chair was sustained.

The question on reconsidering the vote whereby the proposed amendment was refused entry on the records was then put, and was carried by a vote of Yes, 75; No. 58. A motion to postpone indefinitely was defeated.

A vote on the main question was then taken and the proposed amendment was defeated by a vote of Yes, 46; No, 50.

The President, as Chairman of the Executive Committee, reported from that Committee a recommendation that the Society appropriate the same amounts for Prizes and Gratuities for the year 1900 as for the present year, but that the sum of $136.50 be transferred from the appropriation for Prizes and Gratuities for Flowers to that to be awarded by the Committee on School Gardens and Children's Herbariums for Prizes and Gratuities for Native Plants.

The report was accepted, and, agreeably to the Constitution and By-Laws, was laid over for final action on the first Saturday in January next.

The amounts recommended are as follows:

For Prizes and Gratuities for Plants . . .	$2,000 00
" " " " " Flowers . . .	2,531 50
" " " " " Native Plants . .	186 50
" " " " " Fruits . . .	1,732 00
" " " " " Vegetables . . .	1,200 00
" " " " " Gardens . . .	500 00
Total for Prizes and Gratuities for the year 1900 .	$8,150 00

Joseph H. Woodford offered the following vote:

Voted, That the three statues on the building, the two tablets on the walls of the staircase hall, and the two boxes in the corner-stone, be reserved and re-incorporated in the new Horticultural Building about to be erected by the Society.

The vote was referred to the Building Committee.

The following named persons, having been recommended by the

Executive Committee for membership in the Society, were on ballot duly elected:

Larz Anderson, of Brookline.
William H. Derby, of Revere.
Miss Caroline Louisa Williams French, of Boston.
Z. T. Hollingsworth, of Boston and Cohasset.
Charles Lanier, of Lenox.
William E. McClintock, of Chelsea.
John E. Parsons, of Lenox.
Preston Pond, of Winchester.
Barthold Schlesinger, of Brookline.
Henry Davis Sleeper, of Boston and Marblehead Neck.
David T. Strange, of Stoneham.
W. B. Thomas, of Manchester.
Miss Ellen May Tower, of Lexington.
William Benjamin Whittier, of South Framingham.
George Wigglesworth, of Milton.
Miss Adelia Coffin Williams, of Roxbury.
Windsor H. Wyman, of North Abington.

Adjourned to Saturday, December 2.

BUSINESS MEETING.

Saturday, December 2, 1899.

An adjourned meeting of the Society was holden today at eleven o'clock, the President in the chair.

The Schedule of Prizes for the year 1900 was reported by William J. Stewart, Chairman of the Committee for Establishing Prizes, accepted, and ordered to be printed.

J. Woodward Manning, Chairman of the Committee on Flowers, presented the Annual Report of that Committee.

Warren Howard Heustis, Chairman of the Committee on Vegetables, presented the Annual Report of that Committee.

Robert Manning presented his Annual Report as Secretary and Librarian.

These reports were severally accepted and referred to the Committee on Publication.

The Chairman of the Library Committee asked further time to prepare his report, which was granted.

It was voted that when the meeting adjourns it be for two weeks, and that the Secretary notify the Chairmen of Committees who have not presented their reports, and all others from whom reports are due, of this action.

The President, as Chairman of the Building Committee, reported that the Committee had given a great deal of time to the plans for a new building, until now they meet the unanimous approval of the Committee. Two estimates of cost have been made; the first, based on the cost of materials at the time the building was authorized, showing that it could then have been built for the amount appropriated by the Society; the second estimate, made lately, is much higher, so that the Committee have decided to postpone further consideration of the subject until March.

The Secretary announced that a statement of the changes made in the Schedule of Prizes for 1900 from that of 1899 had been printed, and that copies were on the table for distribution.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

WILLIAM TRACY EUSTIS, of Brookline.
HENRY G. JORDAN, of Hingham.
ISAAC H. LOCKE, of Belmont.
MISS ELLEN F. MASON, of Boston.

Adjourned to Saturday, December 16.

BUSINESS MEETING.

SATURDAY, December 16, 1899.

An adjourned meeting of the Society was holden on Saturday at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

William Wallace Lunt, Chairman of the Committee on Plants, presented the Annual Report of that Committee.

Joseph H. Woodford, Chairman of the Committee of Arrangements, presented the Annual Report of that Committee.

Mr. Woodford also presented the Annual Report of the Committee on Gardens.

William E. Endicott, Chairman of the Library Committee, presented the Annual Report of that Committee.

Hon. Aaron Low, Chairman of the Committee on Lectures and Publication, presented the Annual Report of that Committee.

The Secretary of the Society, in behalf of the Committee on Forestry and Roadside Improvement, presented the Annual Report of that Committee.

Henry L. Clapp, Chairman of the Committee on School Gardens and Children's Herbariums, presented the Annual Report of that Committee.

The above-mentioned reports were accepted and referred to the Committee on Publication.

Further time was granted to the Fruit Committee and the Delegate to the State Board of Agriculture to prepare their reports.

The meeting was then dissolved.

REPORT

OF THE

COMMITTEE ON PLANTS,

FOR THE YEAR 1899.

By WILLIAM WALLACE LUNT, CHAIRMAN.

Your Committee present the following report with mingled feelings of pride and gratification at the excellence of the exhibitions made during the year now drawing to a close. Pride, at the number of "new and rare" plants shown before the Society for the first time, and gratification at the renewal of interest of many of the older exhibitors, who, with those of more recent date, are materially aiding your Committee in presenting a very creditable display nearly every Saturday as well as at the regular exhibitions.

At a meeting of the Committee on Establishing Prizes, held a year ago, ways and means were discussed to bring out a more extended exhibition of plants new to cultivation, such as recently discovered species, hybrids between existing kinds, etc., and a revival of the Orchid exhibits of ten or fifteen years ago, there having been a lamentable falling off in these particular classes, as well as in the class for "Groups of Docorative Plants."

Radical changes were proposed, but their advocates found themselves in a hopeless minority, and the matter was allowed to remain dormant until after the death of the late Chairman of this Committee, Azell C. Bowditch, whose long and varied experience and conservative conduct of affairs had done much to establish that prestige for which your Committee on Plants has long been noted.

Notwithstanding this, criticism, in some cases just, had been frequent, and it was to answer this criticism that the radical change, before mentioned, was, in a measure, inaugurated when your Committee, as now constituted, commenced their duties some nine months ago, the results certainly being beyond anything anticipated; there having been not less than three new Palms, fifty-five new Orchids, and seventeen new varieties of Dipladenias exhibited for the first time: this Society having the honor of recording many of them in this country and abroad.

Your Committee may, therefore, assume that their departure from some of the old-time customs, and their endeavors to keep abreast of the times in matters horticultural, have, in a measure, been successful, and that a continuance of this discriminating and liberal, *though not extravagant*, policy in the future, may bring forth equal if not better results the coming year.

It gives your Committee much pleasure to acknowledge the courtesy of Oakes Ames, in placing at their disposal for consultation and reference his unequalled records and herbarium, which have been of inestimable value in determining not a few of the varieties placed on exhibition under other than their correct names.

While there is still hope for improvement in the grouping and arrangement of exhibits, it is certain that more attention than formerly, is paid to artistic details, and this was apparent at the Spring, Rose and Strawberry, and Chrysanthemum Exhibitions.

In conclusion, your Committee would offer the following suggestions: —

1. That in future, exhibitors of groups of plants, pay more attention to correctly marking the name of each variety upon plants exhibited, for the benefit of the public.

2. That they pay more attention to properly finishing off the border of their exhibits, screening from view the lower row of pots and boxes used as plant stands, labelled with remedies for every ill that "flesh is heir to," suggesting to the disappointed exhibitor a possible balm for his wounded feelings.

3. That the proper authorities make some provision for the recognition of the untiring efforts of the gardeners who have exerted their skill and knowledge to perfect for their employers the magnificent specimen plants that are shown throughout the year at our exhibitions.

CATTLEYA x HARDYANA, Young's Var.

It may not be out of place at this time to make some mention of the weekly exhibits of James E. Rothwell (John Mutch, gardener), and H. A. Wheeler, who have done much toward making our Saturday displays interesting and successful.

And last, but not least, your Chairman would here acknowledge his personal obligations to the members of his Committee, who, though making horticulture a profession, have accorded him that generous treatment, which, as an amateur, he hardly expected, but which, on better acquaintance, he finds they willingly give to those who labor for the Goddess Flora.

Among the exhibits of rare botanical interest may be mentioned the following: —

August 5.— Display of Botanical Orchids by Oakes Ames (R. M. Grey, gardener) which were awarded Honorable Mention.

August 19.— *Cattleya Hardyana* by Oakes Ames, a most interesting variety, it having the influence of the *Dowiana* parent entirely obliterated. The Committee asked that it be shown again. It received the award of Honorable Mention.

September 9.— *Cypripedium Kimballianum*, by Oakes Ames, a supposed natural hybrid between *C. Rothschildianum* and *C. Dayanum*, awarded a First Class Certificate of Merit.

November 4.— Display of six new varieties of Anœctochilus, by William Duckham, of Madison, N. J., awarded a Silver Medal.

Among the general exhibits were the following:—

February 11.— Six varieties of *Cymbidium eburneo-Lowianum*, raised and exhibited by George McWilliam, they being of exceptional merit as an *American* production. They were awarded the Society's Gold Medal.

April 8.— *Deutzia* (hybrid) *Lemoineii*, introduced by James Comley, a pleasing improvement which was awarded a gratuity.

April 22.— *Dendrobium densiflorum*, a magnificent specimen, bearing sixteen racemes of beautiful flowers, and a remarkable example of the superior cultivation bestowed upon it by its grower, Edward Butler, who was awarded a Silver Medal.

May 6.— *Areca Ilsemanni* and *Licuala Jeanenceya*, exhibited for the first time in this country by Jason S. Bailey (William Donald, gardener) awarded a Silver Medal and First Class Certificate of Merit, respectively.

RHODODENDRON SHOW.

JUNE 7 AND 8.

Miltonia Bleuana var. *nobilor*, by H. H. Hunnewell (Frederick L. Harris, gardener) exhibited here for the first time and awarded a Silver Medal.

July 1.— *Dipladenia Boliviensis*, grown as a dwarf bedding and decorative plant, by George McWilliam, deemed worthy of a Silver Medal.

July 15.— *Linospadix Petrickiana*, by Jason S. Bailey (William Donald, gardener), first time exhibited,— a Silver Medal.

August 12.— Three specimen plants, distinct varieties of the rare *Cattleya Hardyana*, the varieties being Trenton var., Young's var., and var. Roeblingiana, exhibited by C. G. Roebling (H. T. Clinkaberry, gardener), Trenton, N. J. They were awarded the Appleton Gold, and Society's Silver and Bronze Medals, respectively. Also *Cattleya chrysotoxa*, a fine specimen of superior cultivation, by Bayard Thayer (James Brydon, gardener), a Silver Medal. Seldom have four finer varieties of Orchids been displayed at one time in the halls of this Society, and it gave an impetus to the orchid culture which has been very appreciably felt by growers in the increased demand for finer varieties.

ANNUAL EXHIBITION OF PLANTS AND FLOWERS.

AUGUST 30 AND 31.

Display of hybrid Dipladenias raised by George McWilliam, who began in 1883 to experiment with these plants, and for the past sixteen years has labored incessantly to bring to perfection the remarkable specimens exhibited, which for size and gorgeousness of color are surpassed by but few plants. They were awarded the Society's Gold Medal. There was also exhibited by E. O. Orpet, an American raised seedling *Laelia nigrescens*, a hybrid between *L. pumila* and *L. tenebrosa*, partaking strongly of the latter parent, though lighter in color. It was awarded a First Class Certificate of Merit.

September 23.— *Laelio-Cattleya* Catherine L. Whitin (*C Harrisoniæ* × *L. purpurata*), an American seedling raised and exhibited by George McWilliam and believed to be the first plant of this cross. It was awarded a Silver Medal.

DIPLADENIA BOLIVIENSIS.

ANNUAL EXHIBITION OF FRUITS AND VEGETABLES.

SEPTEMBER 28 AND 29.

Cattleya Portia (*C. Bowringiana*×*C. labiata*,) by E. O. Orpet, a pretty hybrid partaking in a marked degree of the characteristics of *C. Bowringiana*, though the flowers are larger and more intense in coloring: your Committee considered it an improvement and it was awarded a First Class Certificate of Merit.

October 21.— *Cattleya Mantinii* var. *nobilor* (*C. Bowringiana*, var. *floribunda colorata*×*C. Dowiana* var. *aurea*) by Oakes Ames —a fine richly colored hybrid showing just enough of its *Dowiana* parentage in the labellum to make it a much desired acquisition. Awarded a Silver Medal.

CHRYSANTHEMUM SHOW.

NOVEMBER 7, 8, 9 AND 10.

It is no easy task for your Committee to describe properly displays made by the several exhibitors, for where such skill is shown by all it would be manifestly unfair to give one more credit than another. The Chrysanthemum plants shown were of such excellence that the award for First Prize for twelve named plants, judged by points, was a matter of much consideration, Mrs. B. P. Cheney (John Barr, gardener), finally carrying off the prize with the following varieties:

Arethusa.	Mrs. F. A. Constable.
Charity.	Mrs. Weeks.
Iora.	Mutual Friend.
Miss G. Bramhall.	Red Warrior.
Miss Georgianna Pitcher.	Silver Cloud.
Mrs. E. B. Freeman.	The Bard.

Jason S. Bailey was a close second with:

Arethusa.	Ivory.
Black Hawk.	John Shrimpton.
Garza.	Major Bonaffon.
Golden Gate.	Miss Agnes Dalscon.
Golden Trophy.	Mutual Friend.
Iora	The Bard.

Walter Hunnewell and E. S. Converse took third and fourth prizes respectively. Mrs. B. P. Cheney also took Firsts in the following classes:

Three Japanese Incurved, Three Reflexed, Specimen Incurved, Specimen Reflexed, and Specimen Pompon.

The Botanic Garden of Harvard University made a pleasing exhibit of Begonia Gloire de Lorraine (some sixty plants being in the display) and nineteen plants of Chrysanthemums upon the stage in the Upper Hall, both adding very materially to the color effect and success of the exhibition, though not entered in competition.

Much interest was created by some pretty little Chrysanthemum plants grown to bush form by T. D. Hatfield, gardener to Walter Hunnewell, they being all that could be desired as plants for house decoration.

November 25.—*Cymbidium Winnianum* and *Cattleya Chocoensis*, var. *virginalis*, were shown for the first time here by Oakes Ames (R. M. Grey, gardener.) Each was awarded a Silver Medal.

December 25.—*Cypripedium insigne* var. *citrinum*, and *Cypripedium Deedmanianum*, (*C. Spicerianum* × *C. Chamberlainianum*) were shown by Oakes Ames, each receiving a First Class Certificate of Merit. There were also exhibits of Orchids by James E. Rothwell (J. Mutch, gardener), Mrs. J. L. Gardner (William Thatcher, gardener) and H. A. Wheeler. This exhibition being something of a twentieth century innovation, upon its success or failure depended its retention upon the Schedule in future, but for obvious reasons the Committee would recommend it be made a month later, in January.

The amount appropriated for Prizes and Gratuities during the year was	$2,000 00
Prizes and Gratuities have been awarded amounting to	1,815 00
Leaving a balance of	$185 00

out of which Medals, etc., are to be paid for.

Respectfully submitted,

WILLIAM WALLACE LUNT,
JAMES WHEELER,
WM. J. MARTIN,
ARTHUR H. FEWKES,
ROBERT CAMERON,
Committee on Plants.

LAELIA X NIGRESCENS.

PRIZES AND GRATUITIES AWARDED FOR PLANTS.

1899.

January 7.

PRIMULA SINENSIS.— Six plants in not less than six-inch pots:

First, Mrs. B. P. Cheney	4 00
Second, Mrs. B. P. Cheney	3 00
Third, Mrs. John L. Gardner	2 00

PRIMULA STELLATA.— Six plants in not less than six-inch pots:

First, Mrs. B. P. Cheney	3 00
Second, Mrs. John L. Gardner	2 00

PRIMULA OBCONICA HYBRIDS.— Six plants in not less than six-inch pots:

Second, Mrs. John L. Gardner	3 00

Gratuities: —

Mrs. John L. Gardner, Begonia Gloire de Lorraine	1 00
" " " " Primulas	2 00
Mrs. B. P. Cheney, "	2 00
Edward J. Mitton, *Cattleya speciosissima*	1 00

January 21.

Gratuities: —

Walter E. Coburn, Fifteen plants Primula Sinensis	3 00
James E. Rothwell, *Cypripedium signatum Calypso*	1 00
" " " " *Lucienianum superbum*	1 00

February 4.

FREESIAS.— Six pots or pans:

First. Charles H. Souther	5 00

Gratuities: —

Charles H. Souther, *Begonia incarnata* (improved)	2 00
Harvard Botanic Garden, Collection of Orchids and Freesias	10 00
Mrs. John L. Gardner, Display of *Primula Sinensis* and *Erica melanthera*	4 00
George McWilliam, Display of Seedling Cypripediums	2 00
H. A. Wheeler, " " Orchids	1 00

February 11.

Gratuity: —

Mrs. J. C. Whitin (William McAllister, gardener), Specimen *Dendrobium nobile*	3 00

February 18.

Gratuities: —

Edward J. Mitton, Two plants of *Cattleya Trianæ*	5 00
James E. Rothwell, *Cypripedium Leeanum*, var. *Masareelianum*	2 00

MARCH 4.

Gratuities:—

Mrs. John L. Gardner, Display of Cyclamen and Violets . . 5 00
James E. Rothwell, *Oncidium tigrinum* 1 00
Harvard Botanic Garden, Display of Orchids 10 00

MARCH 18.

Gratuity:

James E. Rothwell, *Sophronitis grandiflora* 1 00

SPRING EXHIBITION.

MARCH 21, 22, 23 AND 24.

Theodore Lyman Fund.

INDIAN AZALEAS.— Specimen Plant, named:
First, Dr. C. G. Weld 10 00
Second, Dr. C. G. Weld 8 00
Third, H. A. Wheeler 5 00
ERICAS.— Six, not less than three species:
Second, Bussey Institution 4 00

Society's Prizes.

ORCHID.— Single plant:
First, James E. Rothwell 12 00
Second, Edward Butler 10 00
Third, Mrs. J. C. Whitin 6 00
Fourth, J. S. Bailey 4 00
STOVE OR GREENHOUSE PLANT.— Specimen in bloom other than Azalea or Orchid, named:
First, Dr. C. G. Weld 8 00
HARDWOODED GREENHOUSE PLANTS.— Four, in bloom:
First, Dr. C. G. Weld 10 00
Second, Dr. C. G. Weld 8 00
CLIMBING ROSE.— Specimen plant in bloom:
First, C. H. Souther 8 00
HARDY FLOWERING DECIDUOUS SHRUBS, FORCED.— Four, of four distinct species, named:
First, Bussey Institution 6 00
HARDY FLOWERING EVERGREEN SHRUBS, FORCED.— Four, of four distinct species, named:
First, Bussey Institution 6 00
CANNAS.— Display, not less than ten plants, in pots:
First, James L. Little 10 00
Second, James L. Little 8 00

HARDY PRIMROSES.— Twelve plants of distinct varieties:

First, Dr. C. G. Weld	6 00
Second, Mrs. John L. Gardner	4 00

HARDY POLYANTHUSES.— Twelve plants of distinct varieties:

First, Mrs. John L. Gardner	6 00
Second, Bussey Institution	4 00

CYCLAMENS.— Ten plants:

First, Mrs. B. P. Cheney	15 00
Second, Mrs. B. P. Cheney	12 00
Third, Dr. C. G. Weld	10 00

Ten plants in not over seven-inch pots:

First, Dr. C. G. Weld	8 00
Second, Mrs. B. P. Cheney	6 00
Third, Mrs. B. P. Cheney	4 00

Single plant:

Second, Mrs. B. P. Cheney	4 00
Third, Mrs. B. P. Cheney	3 00

CINERARIAS.— Six varieties:

First, James Garthley	10 00
Second, Charles H. Souther	8 00
Third, J. S. Bailey	6 00
Fourth, Mrs. John L. Gardner	5 00

Three varieties:

First, James Garthley	6 00
Second, Mrs. John L. Gardner	5 00
Third, J. S. Bailey	4 00

Single plant:

First, James Garthley	4 00
Second, Mrs. John L. Gardner	3 00
Third, J. S. Bailey	2 00

HYACINTHS.— Twelve named varieties in pots, one in each pot:

First, Mrs. John L. Gardner	6 00
Second, Bussey Institution	4 00

Six named varieties in pots, one in each pot:

First, Bussey Institution	5 00
Second, Mrs. John L. Gardner	4 00
Third, E. S. Converse	3 00

Single named bulb, in pot:

First, Mrs. John L. Gardner	2 00
Second, Bussey Institution	1 00

Three pans, not to exceed twelve inches, ten bulbs of one variety in each pan:

First, Dr. C. G. Weld	6 00
Second, Mrs. John L. Gardner	4 00
Third, Mrs. John L. Gardner	3 00

Two pans, not to exceed twelve inches, ten bulbs of one variety in each pan:

First, Mrs. John L. Gardner	4 00
Second, Dr. C. G. Weld	3 00
Single pan, not to exceed twelve inches, with ten bulbs of one variety:	
First, Mrs. John L. Gardner	3 00
Second, Bussey Institution	2 00
Third, Bussey Institution	1 00
TULIPS.— Six eight-inch pans, nine bulbs of one variety in each:	
First, William S. Ewell & Son	4 00
Second, E. S. Converse	3 00
Third, Bussey Institution	2 00
Three eight-inch pans, nine bulbs of one variety in each:	
First, William S. Ewell & Son	3 00
Second, E. S. Converse	2 00
Third, Bussey Institution	1 00
Three ten-inch pans, twelve bulbs of one variety in each:	
First, William S. Ewell & Son	5 00
Second, E. S. Converse	4 00
Third, Bussey Institution	3 00
Fourth, Bussey Institution	2 00
POLYANTHUS NARCISSUS.— Four seven-inch pots, four bulbs in each, distiuct varieties:	
First, Mrs. John L. Gardner	4 00
Second, Bussey Institution	3 00
JONQUILS.— Six pots or pans, not exceeding eight inches, the number of bulbs in each to be at the discretion of the grower:	
First, William S. Ewell & Son	4 00
Second, Bussey Institution	3 00
Third, Dr. C. G. Weld	2 00
NARCISSUSES.—Six eight-inch pans, distinct varieties, single or double:	
First, Dr. C. G. Weld	4 00
Second, William S. Ewell & Son	3 00
Three eight-inch pans:	
First, Dr. C. G. Weld	3 00
Second, William S. Ewell & Son	2 00
LILY OF THE VALLEY.— Six pots or pans, not exceeding eight inches:	
Second, Bussey Institution	3 00
CROCUSES.— Three boxes, each eight by twenty inches, three distinct varieties:	
First, William S. Ewell & Son	3 00
Second, Bussey Institution	2 00
FREESIAS.— Six pots or pans:	
First, Dr. C. G. Weld	3 00
ROMAN HYACINTHS.— Six eight-inch pans, ten bulbs in a pan:	
First, Bussey Institution	3 00
Second, Dr. C. G. Weld	2 00
Third, William S. Ewell & Son	1 00

GENERAL DISPLAY OF SPRING BULBS.— All Classes:

First, William S. Ewell & Son	15 00
Second, Bussey Institution	12 00

Gratuities:—

E. S. Converse, Display of Cinerarias	3 00
C. H. Souther, Display of *Cineraria stellata*	3 00
Mrs. B. P. Cheney, Hybrid Roses and Cinerarias	12 00
James Garthley, Display of Cyclamens	3 00
Bussey Institution, Forced Hardy Plants and Shrubs	5 00
Edward Butler, Display of Orchids	5 00
Yamanaka & Co., Display of Japanese Plants	15 00
Mrs. John L. Gardner, Display of Hyacinths	4 00
Dr. C. G. Weld, Display of Hyacinths	2 00

APRIL 1.

Gratuities:—

Warren Heustis & Son, *Rubus rosaefolius*	2 00
Edward Butler, *Dendrobium nobile*	4 00
H. A. Wheeler, *Dendrobium Wardianum*	1 00

APRIL 8.

Gratuities:—

James Comley, *Deutzia hybrida Lemoinei*	5 00
James E. Rothwell, *Cypripedium Robelenii*	3 00

MAY 6.

PELARGONIUMS.— Six named Show or Fancy varieties, in not less than eight-inch pots:

First, C. H. Souther	10 00

INDIAN AZALEAS.— Six plants in pots, named:

First, Dr. C. G. Weld	8 00

Single specimen:

First, Dr. C. G. Weld	3 00
Second, Dr. C. G. Weld	2 00

CALCEOLARIAS.— Six varieties in pots:

First, Mrs. B. P. Cheney	10 00
Second, Mrs. B. P. Cheney	8 00

Single plant:

First, Mrs. B. P. Cheney	3 00
Second, Mrs. B. P. Cheney	2 00
Third, Mrs. B. P. Cheney	1 00

ORCHIDS.— Display, named:

First, James E. Rothwell	12 00

AMARYLLISES.— Six pots, distinct varieties:

First, Dr. C. G. Weld	8 00

Gratuities:—

Jason S. Bailey, *Cattleya Mendelli* 1 00
Mrs. B. P. Cheney, Calceolarias 2 00
Dr. C. G. Weld, Display of Azalea and *Boronia elatior* . . 5 00
Dr. C. G. Weld, Display 4 00
Charles H. Souther, Ivy-leaved Pelargoniums 2 00

MAY 20.

Gratuity:—

Rea Brothers, Display of *Primula Sieboldi* 2 00

MAY 27.

Gratuity:—

James E. Rothwell, *Uropedium Lindeni* 1 00

RHODODENDRON EXHIBITION.

JUNE 7 AND 8 (*postponed from* JUNE 1 AND 2).

ORCHIDS.— Display, arranged for effect, with foliage plants, in a space eight feet by five feet:

First, H. H. Hunnewell 30 00
Second, J. S. Bailey 25 00
Third, J. E. Rothwell 20 00

Gratuities:—

Mrs. Walter E. Searles, Boston Fern 3 00
Robert Laurie, Newport, R. I., *Araucaria Bidwillii* . . . 3 00
Edward Butler, *Cattleya Gaskelliana* 5 00
Edward J. Mitton, Pelargoniums 8 00
Dr. C. G. Weld, Display of Pelargoniums and Orchids . . . 8 00

JUNE 10.

Gratuity:—

Dr. C. G. Weld, Display of Orchids and Pelargoniums . . 10 00

ROSE AND STRAWBERRY EXHIBITION.

JUNE 22 AND 23.

DECORATIVE PLANTS.— Group, arranged for effect, covering seventy-five square feet:

First, J. S. Bailey 30 00
Second, E. S. Converse 25 00

ORCHIDS.— Six plants, of six named varieties, in bloom:

First, James E. Rothwell 15 00

Second, W. P. Winsor 10 00
Three plants, of three named varieties, in bloom:
First, W. P. Winsor 10 00
Single specimen, named:
First, W. P. Winsor 5 00
Second, W. P. Winsor 3 00

Gratuity:—
J. S. Bailey, *Acalypha hispida* 4 00

JULY 1.

Gratuity:—
Edward J. Mitton, *Cattleya Gigas* 2 00

JULY 8.

Gratuity:—
Edward J. Mitton, *Cattleya Gaskelliana* 1 00

JULY 15.

HYDRANGEAS.— Pair, in tubs:
First, H. Dumaresq 15 00
Second, H. Dumaresq 10 00
Single plant, in tub or pot:
First, H. Dumaresq 5 00
ACHIMENES.— Six, of six varieties, in not over ten-inch pans or pots:
First, H. Dumaresq 5 00

Gratuity:—
Mrs. John L. Gardner, Display 2 00

EXHIBITION OF AQUATIC PLANTS AND FLOWERS, ASTERS, ETC.

AUGUST 19.

OUVIRANDRA FENESTRALIS:
First, E. S. Converse 6 00
Second, Mrs. John L. Gardner 4 00
CANNAS.— Collection of not less than six named varieties, grown in pots:
Third, Mrs. John Jeffries 6 00

Gratuity:—
H. A. Wheeler, *Epidendrum venosum* 1 00

ANNUAL EXHIBITION OF PLANTS AND FLOWERS.

AUGUST 30 AND 31.

H. H. Hunnewell Fund.

HARDY CONIFEROUS TREES.— Display in pots and tubs, named:
First, Francis Blake 25 00

Society's Prizes.

PALMS.— Pair, in pots or tubs not more than twenty-four inches in diameter:
First, J. S. Bailey 12 00
Pair, in pots not more than fourteen inches in diameter:
First, Mrs. John L. Gardner 8 00
Second, Dr. C. G. Weld 6 00
GREENHOUSE PLANTS.— Collection containing foliage plants of all descriptions, not to exceed forty plants, in pots or tubs:
First, J. S. Bailey 40 00
Second, Mrs. John L. Gardner 30 00
Six Greenhouse and Stove plants, of different named varieties, two Crotons admissible:
First, J. S. Bailey 25 00
Second, Mrs. John L. Gardner 20 00
Third, Dr. C. G. Weld 15 00
TABLE DECORATION. — For fifteen covers, living plants, in one receptacle, only one entry admissible:
First, James E. Rothwell 10 00
Second, W. H. Lincoln 8 00
Third, E. J. Mitton 6 00
Fourth, H. A. Wheeler 4 00
SPECIMEN FLOWERING GREENHOUSE PLANT.— Single named variety:
First, James Garthley 8 00
Second, James E. Rothwell 6 00
FUCHSIAS.— Six plants:
Second, Charles H. Souther 10 00
CALADIUMS.— Six named varieties:
First, Charles H. Souther 8 00
FERNS.— Specimen, other than Tree Fern:
First, J. S. Bailey 4 00
Second, Dr. C. G. Weld 3 00
ADIANTUMS.— Four named varieties:
First, Dr. C. G. Weld 8 00
LYCOPODS.— Four named varieties:
First, Dr. C. G. Weld 5 00

DRACÆNAS.— Six named varieties:
First, J. S. Bailey 8 00
Second, Dr. C. G. Weld 6 00
CROTONS.— Twenty-five plants, not less than eighteen named varieties in not less than six-inch pots:
First, James E. Rothwell 12 00
Second, J. S. Bailey 10 00
Third, Edward J. Mitton 8 00
Six named varieties, in not less than eight-inch pots:
First, Dr. C. G. Weld 10 00
Second, W. H. Lincoln 8 00
CYCAD.— Single plant, named:
First, Mrs. John L. Gardner 10 00
NEPENTHES.— Three plants, named:
Second, Edward J. Mitton 8 00
BEGONIA REX.— Six pots of six varieties:
First, E. S. Converse 8 00
BEGONIA REX HYBRIDS.— Collection, named:
First, E. S. Converse 8 00

Gratuities:—
Oakes Ames, Caladiums 3 00
J. M. Southwick, Seedling Begonia, Woodstock 1 00
James Comley, *Fourcroya Lindeni* 5 00
E. S. Converse, Display of Greenhouse and Stove plants . . 15 00
Harvard Botanic Garden, Display of Orchids 8 00
John Shepard, *Oncidium Carthaginense* 1 00

SEPTEMBER 8.

Gratuity:—
Edward J. Mitton, *Cattleya labiata* 2 00

SEPTEMBER 16.

Gratuities:—
James E. Rothwell, *Cypripedium Isabellæ* and *C. Josephianum* . 2 00
H. A. Wheeler, *Cattleya chrysotoxa* 1 00

ANNUAL EXHIBITION OF FRUITS AND VEGETABLES.

SEPTEMBER 28 AND 29.

DECORATIVE PLANTS.— Display, not less than forty, not to exceed three feet in height, to be arranged by the Committee:
First, J. S. Bailey 25 00
Second, E. S. Converse 20 00

OCTOBER 28.

Gratuities:—
Edward J. Mitton, *Oncidium varicosum* 1 00
H. A. Wheeler, *Cattleya labiata* 2 00

CHRYSANTHEMUM SHOW.

NOVEMBER 7, 8, 9, AND 10.

CHRYSANTHEMUMS.—Display of twelve named plants, any or all classes, distinct varieties:

First, Mrs. B. P. Cheney	50 00
Second, J. S. Bailey	40 00
Third, Walter Hunnewell	30 00
Fourth, E. S. Converse	20 00
Three Japanese Incurved:	
First, Mrs. B. P. Cheney	10 00
Three Reflexed, distinct named varieties:	
First, Mrs. B. P. Cheney	10 00
Specimen Incurved, named variety:	
First, Mrs. B. P. Cheney	6 00
Second, James Garthley	5 00
Third, Mrs. B. P. Cheney	4 00
Specimen Reflexed, named variety:	
First, Mrs. B. P. Cheney	6 00
Second, Mrs. B. P. Cheney	5 00
Third, Mrs. B. P. Cheney	4 00
Specimen Anemone Flowered, named variety:	
First, Walter Hunnewell	6 00
Second, James Garthley	5 00
Specimen Pompon, named variety:	
First, Mrs. B. P. Cheney	4 00
Second, Walter Hunnewell	3 00
Twelve plants, of twelve different varieties, grown to one stem and bloom, in not over six-inch pots, preference being given to plants not more than three feet in height:	
First, C. H. Souther	8 00
Second, Dr. C. G. Weld	6 00
Third, E. S. Converse	4 00
Fourth, H. Dumaresq	2 00
Six plants grown as above but all one color, Red:	
First, Dr. C. G. Weld	4 00
Second, H. Dumaresq	3 00
Third, E. S. Converse	2 00
White:	
First, Dr. C. G. Weld	4 00
Second, E. S. Converse	3 00
Third, C. H. Souther	2 00
Pink:	
First, C. H. Souther	4 00
Second, Dr. C. G. Weld	3 00
Third, Dr. C. G. Weld	2 00

Yellow:
First, James Nicol 4 00
Second, James Nicol 3 00
Third, E. S. Converse 2 00
Any other color:
First, Dr. C. G. Weld 4 00
Second, C. H. Souther 3 00
Third, E. S. Converse 2 00
Six plants grown to bush form, in not over eight-inch pots, without stakes:
First, Walter Hunnewell 8 00
Second, Walter Hunnewell 6 00
Group of Chrysanthemums, arranged for effect, with palms and decorative foliage plants, limited to one hundred square feet:
First, Mrs. John L. Gardner 25 00
Second, Mrs. John L. Gardner 20 00
Third, E. S. Converse 15 00

Gratuities:—
Harvard Botanic Garden, Display (nineteen plants) of Chrysanthemums 15 00
James Garthley, Specimen Chrysanthemum plant 2 00
Dr. C. G. Weld, Display of Begonia Gloire de Lorraine . . . 3 00
Harvard Botanic Garden, Display (sixty plants) of Begonia Gloire de Lorraine 12 00
William W. Edgar, Display of Begonia Gloire de Lorraine, Ferns, and Dracænas 8 00
Lager & Hurrell, Summit, N. J., Display of Orchids . . . 15 00

NOVEMBER 18.

Gratuity:—
H. A. Wheeler, *Odontoglossum crispum* 1 00

NOVEMBER 25.

Gratuity:—
J. E. Rothwell, Cypripedium Charles Canham 1 00

DECEMBER 2.

Gratuities:—
J. E. Rothwell, *Cypripedium Leeanum* 1 00
J. E. Rothwell, *Odontoglossum crispum* 1 00

DECEMBER 9.

ORCHIDS.—Six plants, named varieties, in bloom:
First, J. E. Rothwell 15 00
Second, J. E. Rothwell 10 00

Three plants, named varieties, in bloom:
First, J. E. Rothwell 10 00
Second, Mrs. John L. Gardner 8 00
Single plant, named, in bloom:
First, Mrs. John L. Gardner 5 00
Second, J. E. Rothwell 4 00

Gratuity:
Mrs. John L. Gardner, Display of Primulas 3 00

SOCIETY'S GOLD MEDALS.

February 11. George McWilliam for Seedling *Cymbidium eburneo-Lowianum.*
August 30. George McWilliam for Seedling Dipladenias.

APPLETON GOLD MEDAL.

August 12. C. G. Roebling, Trenton, N. J., for *Cattleya* × *Hardyana*, Trenton var.

SILVER GILT MEDALS.

January 28. J. E. Rothwell, for *Cypripedium* × *Chapmanii* var. *rubellum.*
May 27. J. E. Rothwell, for *Cypripedium* × *Aylingii.*

SOCIETY'S SILVER MEDALS.

January 7. J. E. Rothwell, for *Cypripedium Exul.*
February 4. George McWilliam, for *Cypripedium* × *Hobsonii.*
" 25. C. G. Roebling, for *Cypripedium* × *Roeblingianum.*
March 4. Mrs. John L. Gardner, for Superior Cultivation of *Erica melanthera.*
April 15. George McWilliam, for Cypripedium × Mrs. George Marston Whitin.
April 22. Edward Butler, for Superior Cultivation of *Dendrobium densiflorum.*
May 6. J. S. Bailey, for *Areca Ilsemanni* (new palm).
" 20. J. E. Rothwell, for *Cypripedium leuchochilum* var. *Rothwellianum.*
Rhododendron Exhibition, June 7 and 8. H. H. Hunnewell, for *Miltonia Bleuana* var. *nobilior.*
July 1. George McWilliam, for *Dipladenia Boliviensis*, grown as a dwarf decorative plant.
" 15. J. S. Bailey, for *Sinospadie Petrickiana* (new palm).
August 12. C. G. Roebling, for *Cattleya* × *Hardyana*, Young's var.
" " Bayard Thayer, for Superior Cultivation of *Cattleya chrysotoxa.*
September 23. George McWilliam, for Laelio-Cattleya Catherine L. Whitin

October 21. Oakes Ames, for *Cattleya×Mantini*, var. *nobilior*.
November 4. William Duckham, for Display of six new varieties of Anoectochilus.
November 25. Oakes Ames, for *Cymbidium× Winnianum*.
" " Oakes Ames, for Specimen plant of *Cattleya chocoensis* var *virginalis*.
December 23. W. A. Manda, Orange, N. J., for *Cypripedium insigne* var. Mrs. George B. Wilson.

SOCIETY'S BRONZE MEDALS.

May 13. J. E. Rothwell, for Display of *Cypripedium niveum*.
August 12. C. G. Roebling, for *Cattleya× Hardyana* var. *Roeblingiana*.
November 4. Oakes Ames, for *Cypripedium insigne* var. *Ballae*.
" 18. J. E. Rothwell, for *Cypripedium×* Fairy Queen.

FIRST CLASS CERTIFICATES OF MERIT.

January 7. Oakes Ames, for Cypripedium× Madame Georges Truffaut.
" 14. J. E. Rothwell, for *Dendrobium Phalaenopsis* var. *albens*.
March 4. Rea Brothers, for *Deutzia discolor purpurescens*.
" " W. P. Winsor, *Dendrobium nobile*, var. *virginalis*.
Spring Exhibition, March 21–24. Dr. C. G. Weld, for Superior Cultivation of *Primula obconica*.
" " W. A. Manda, South Orange, N. J., for *Oncidium Saintlegerianum*.
April 1. J. E. Rothwell, for *Cypripedium× Lebaudianum*.
" 15. J. E. Rothwell, for *Cypripedium Rothschildianum*.
May 6. J. S. Bailey, for *Licuala Jeanenceyi*.
" 13. James Garthley, for Superior Cultivation of Zonale Pelargoniums.
June 3. H. H. Hunnewell, for Superior Cultivation of *Miltonia vexillaria*.
August 5. H. A. Wheeler, for Superior Cultivation of *Oncidium sarcodes*.
" 12. J. E. Rothwell, for *Laelia (Brassavola) Digbyana*.
Exhibition of Aquatic Plants and Flowers, Asters, etc., August 19. Mrs. John Jeffries, for *Nephrolepis exaltata* (sport).
Annual Exhibition of Plants and Flowers, August 30 and 31. E. O. Orpet, for *Laelia nigrescens*.
September 9. Oakes Ames, for *Cypripedium Kimballianum*.
" 16. J. E. Rothwell, for *Cypripedium× Thayerianum*.
" 23. J. E. Rothwell, for Cypripedium×H. Ballantine.
" " J.E. Rothwell, *Cypripedium× Uihleinianum (Allanianum)*.
Annual Exhibition of Fruits and Vegetables, September 28 and 29. E. O. Orpet, for *Cattleya Portia (C. Bowringiana ♀ × C. labiata ♂)*.
October 21. Oakes Ames, for *Cypripedium Smithii× Lucie (C. Lawrenceanum× C. ciliolare)*.

November 4. Oakes Ames, for *Batemannia Burtii.*
" " J. E. Rothwell, for *Cypripedium* × *Hurrellianum (C. Curtisii* × *C. Argus).*
" " J. E. Rothwell, for *Cypripedium regale* var. *purpuratum (C. insigne Maulii* × *purpuratum).*
November 25. J. E. Rothwell, for *Cypripedium Maynardii (C. Spiceria-num* × *C. purpuratum).*
December 2. J. E. Rothwell, for *Cypripedium Alcides (C. insigne* × *C. hirsutissimum.)*
December 9. Oakes Ames, for *Cypripedium insigne* var. *citrinum.*
" " Oakes Ames, for *Cypripedium Deedmannianum.*
December 16. George McWilliam, for *Luculia gratissima.*

HONORABLE MENTION.

January 14. R. and J. Farquhar, *Begonia nana compacta* Gloire de Lorraine.
February 18. F. Prideux, *Cineraria Stellata*, hybrid.
March 11. R. and J. Farquhar, Cyclamen Bush Hill Pioneer.
Spring Exhibition, March 21–24. W. A. Manda, Begonia Vernon, double.
April 1. C. G. Roebling, *Cattleya Trianæ*, var. *Roeblingiana.*
Rhododendron Show, June 7 and 8. Dr. C. G. Weld, Seedling Zonale Pelargonium.
August 5. Oakes Ames, Collection of Botanical Orchids.
August 19. Oakes Ames, *Cattleya Gigas* × (*Hardyana?*).
October 28. John Mutch, *Cypripedium* × *Bingleyense* var. *Longwoodense.*

WILLIAM WALLACE LUNT,
JAMES WHEELER,
WILLIAM J. MARTIN,
ARTHUR H. FEWKES,
ROBERT CAMERON,
} *Committee on Plants.*

REPORT

OF THE

COMMITTEE ON FLOWERS.

FOR THE YEAR 1899.

By J. WOODWARD MANNING, CHAIRMAN.

The exhibitions for the year 1899, although in many instances of sterling merit, have not, on the whole, been up to the standard of past years. The peculiar weather conditions through which we have passed seriously interfered with the best efforts of our exhibitors at the time of the principal shows, and this effect continued more or less throughout the season. Taking the exhibitions in their chronological order, our report would be as follows:

During January the usual classes of exhibits were brought in and the more noteworthy were those of Oakes Ames, on the 7th, of a spike of *Cattleya chocoensis alba* which was particularly beautiful in its purity of color, and of which your Committee made Honorable Mention.

On January 21, J. E. Rothwell made an exhibit of *Laelia anceps* var. *Ballentinianum*.

During the Carnation and Orchid Show of February 4, the new Carnation Olympia, from John N. May, of Summit, N. J., received a First Class Certificate and the new Carnation Melba was given Honorable Mention. The balance of the month was taken up with the usual variety of exhibits and the more noteworthy awards were those of a gratuity to James E. Rothwell, for a fine spike of *Cattleya Trianae* var. *Backhousiana* and to the Harvard Botanic Garden for a fine display of *Toxicophlaea spectabilis*.

SPRING EXHIBITION.

MARCH 21, 22, 23, AND 24.

There was less competition at this show than in past years, and Hybrid Perpetual Roses were shown by few exhibitors only. The Carnation exhibit was closely contested and Violets were shown to the best possible effect. The new white Carnation Marquis, shown by Mr. E. L. Marquisee, was very noteworthy and was awarded the Society's Silver Medal. At the same exhibition Kenneth Finlayson displayed the new crested form of *Cyclamen Persicum*, for which a First Class Certificate of Merit was given.

April 1, Hon. C. G. Roebling, of Trenton, N. J., exhibited *Cypripedium villosum giganteum*, of which Honorable Mention was made by the Committee.

May 6, James E. Rothwell was awarded a First Class Certificate of Merit for superior culture of *Phalaenopsis grandiflora*.

RHODODENDRON SHOW.

JUNE 7 AND 8.

Rhododendrons, in the June exhibits, had suffered very severely from drought and while the exhibits were, in the main, very commendable, yet as compared with previous years they could hardly be considered superior. At the exhibition of June 7 and 8, Herbert Dumaresq was awarded a First Class Certificate of Merit for a particularly noteworthy display of *Bougainvillea spectabilis*.

PÆONY SHOW.

JUNE 10.

This was very effective and gave added evidence of the increase in popularity and value of this thoroughly hardy class of flowers. The display of blooms arranged for effect in the Society's vases called forth great admiration, and in many ways was considered fully as satisfactory as similar exhibits that are made later in the season with Chrysanthemums.

ROSE EXHIBITION.

JUNE 22 AND 23.

Unfortunately the drought had so severely interfered with the growth of Roses that the Rose Exhibition was in many respects a failure. Had it not been for the remarkable display made by the Heirs of Hon. Joseph S. Fay, the exhibition would hardly have warranted opening the doors. Under the circumstances, the above-named exhibitors practically swept the prizes throughout almost every class scheduled. At this exhibition Jackson T. Dawson displayed vases of Hybrid Roses, crosses between *Rosa Wichuraiana* and older garden forms. Among these crosses, one between *Rosa Wichuraiana* and *Rosa Indica carnea* was particularly noteworthy and was granted a Silver Medal by your Committee. Another similar cross, exhibited by Mr. Dawson under the name of William Eagan was granted a First Class Certificate of Merit.

July 1, among the many displays of Roses shown by the Heirs of Hon. Joseph S. Fay, was a new seedling Rose, a cross between *Rosa Wichuraiana* and Baroness Rothschild, which was given a Silver Medal by your Committee.

The Exhibition of Hollyhocks on the 8th of July was not up to the standard, owing to the severe killing that had been suffered by the plants during the previous winter.

July 29, Hicks Arnold made a display of *Cattleya Hardyana*, a choice species of extremely high merit for ornament, for which a Silver Medal was awarded by the Society. At this same exhibition, a very remarkable display of seedling Dipladenias was made by George McWilliam of Whitinsville, Mass. Among the differing varieties shown, a Silver Gilt Medal was awarded the variety George M. Whitin, a Silver Medal to the variety Mrs. George McWilliam, and a Bronze Medal to the variety Miss Lois H. Whitin. Perennial Phloxes were first exhibited July 29 and continued to be a very prominent feature of the exhibits throughout the remainder of the summer and autumn.

August 5, Dr. C. G. Weld was awarded a Silver Medal for *Watsonia Adernei*, and James F. Harlow was given a First Class Certificate of Merit for each of the new Gladiolii, Mme. Desbordes

Valmore and Baron Jos. Hulot. James E. Rothwell was given a First Class Certificate of Merit for superior culture of Cypripedium Frau Ida Brandt and *C. Edwardii* var. *superbum superbiens* and *C. Fairieanum*.

EXHIBITION OF AQUATIC PLANTS AND FLOWERS.

AUGUST 19.

The exhibition of Aquatics was not as satisfactory this season as in past years. This was accounted for in some instances by the severe drought influencing the level of the ponds to such an extent as seriously to interfere with the satisfactory blooming of aquatics. Bayard Thayer was granted a Silver Medal for *Nymphaea Brydonacea elegans* and the Henry A. Dreer Corporation of Philadelphia, was awarded a First Class Certificate of Merit for *Nymphaea fulva* and *N. rubra punctata*. At the same time E. G. Shaylor was granted a Silver Medal for Hybrid Gladioli, which were particularly rich in their varied color, and J. W. Howard received a First Class Certificate of Merit for a vase of Giant Comet China Asters, a pure white form of extraordinary size and strong growth; also for China Aster Daybreak, a variety of a most charming rich shade of pink and of first-class quality and size.

ANNUAL EXHIBITION OF PLANTS AND FLOWERS.

AUGUST 30 AND 31.

From the middle of August until hard frosts Dahlias were the showiest features of the exhibitions, and the display of Dahlias at the Annual Exhibition was in many respects a revelation of the worth of this flower. There was a marked increase in the size and quality of the blooms and also a greater range of color as compared with previous years. The Dahlia Show was most admirably staged by the competitors and the competition was extremely close. Altogether, it was probably the most successful of any class of flowers during the past season. In connection with the Dahlia Show, a most admirable exhibition of Perennial Phloxes was made by Rea Brothers, showing the great improvement in the size of

the flowers and their range of color. Cornelius Vanderbilt, of Newport, R, I., made a very effective display of named Montbretias, Besseras, and Acidantheras, and at this exhibition Oakes Ames gave us one of the most satisfactory displays of aquatics made during the season. James Brydon was awarded Honorable Mention for his new variety of Nymphæa called Arethusa.

During September, Dahlias continued to be shown in great profusion and the desirability of extending the scheduled awards of this class of plants was evident.

September 16, Frederick S. Davis made a display of *Incarvillea variabilis*, of which Honorable Mention was made by your Committee.

On the 4th of November H. A. Wheeler was granted a First Class Certificate of Merit for *Zygopetalum Mackayi* var. *cæruleum*, showing great improvement in depth of color and markings over the old type.

CHRYSANTHEMUM SHOW.

November 7, 8, 9, and 10.

Competition was not as close at this exhibition as in past years. The exhibits made by the Waban Conservatories were fully up to the standard of previous seasons as was also the case with most of the other exhibits, but owing to the lack of competition as compared with other years the hall was not as well filled with flowers as in other seasons, thus making a less effective display. Competition for the best arrangement of Chrysanthemums in the Society's vases was close, and the awards, from the reading of the Schedule, necessarily varied from day to day according to the satisfactory condition in which the vases were maintained by the exhibitors. A change in the Schedule whereby the award on each particular day was to be final has been suggested, and probably would be much more satisfactory to exhibitors than the past method. The number of competitors was less than was hoped, but there probably will be a great increase under the new arrangement. There were no entries of any Seedling Chrysanthemums, which would indicate less interest in their production than in past seasons. Dr. F. I. Williams received Honorable Mention for Chrysanthemum Bessie Jones.

Charles S. Cooper was awarded Honorable Mention for a new Carnation exhibited under the name of Crawford. Other Honorable Mentions were granted Mr. E. F. Wilson for Cosmos Klondike and John Cook for the Hybrid Tea Rose Baltimore.

The exhibition of Hardy Perennials throughout the season has been very satisfactory and promises to be one of the most important features in coming years. While severe weather conditions, it is true, seriously interfered with the most satisfactory results, as in the past two years, still an impetus for increased competition will probably be given with the advent of better weather conditions in future years. We presume that our restricted facilities have been something of a discouragement to some exhibitors and feel confident that the enlarged accommodations in our new hall will bring forth far greater competition than ever in the past.

Herewith we append the list of prizes and other awards granted by your Committee during this season. The amount of our appropriation for the year 1899 was $2,668; the amount of awards and gratuities was $2,076, leaving a balance of $592, from which the cost of Medals and First Class Certificates of Merit and awards of the Native Plant Committee are to be deducted.

Respectfully submitted,

J. WOODWARD MANNING,

Chairman Flower Committee.

PRIZES AND GRATUITIES AWARDED FOR FLOWERS.

1899.

January 7.

Primula Sinensis.— Display of fifty or more individual blooms:	
First, Walter E. Coburn	$2 00
Second, Mrs. John L. Gardner	1 00
Freesias.— Vase of fifty spikes:	
First, Mrs. E. M. Gill	2 00
Second, W. N. Craig	1 00
Gratuities: —	
W. N. Craig, Vase of *Cypripedium insigne*	3 00
James E. Rothwell, Seedling Varieties of *Cypripedium insigne*	2 00

January 28.

Gratuities: —	
James Comley, Display	3 00
Mrs. E. M. Gill, "	2 00

February 4.

Orchids.— Display of named species and varieties, filling not less than twenty bottles:	
First, Mrs. John L. Gardner	15 00
Second, J. E. Rothwell	10 00
Violets.— Best collection of varieties, fifty blooms of each in a bunch:	
First, Norris F. Comley	4 00
Carnations.— Display of cut blooms with foliage, not less than six varieties, in vases:	
First, William Nicholson	8 00
Second, M. A. Patten	6 00
Third, S. J. Goddard	4 00
Camellias.—Display of named varieties, cut flowers with foliage, not less than twelve blooms, in not less than six varieties:	
First, James Comley	4 00
Second, James Comley	3 00
Gratuities: —	
Walter E. Coburn, Chinese Primroses	1 00
James Comley, Display	2 00
Mrs. E. M. Gill, "	1 00
George McWilliam, Display	1 00

FEBRUARY 11.

Gratuities: —

Mrs. J. C. Whitin, Display of *Phaius grandifolius* . . . 1 00
J. E. Rothwell, Display of *Cypripedium Harrisii* var. *superbum* . 1 00
Jason S. Bailey, Vase of Carnations 2 00

FEBRUARY 18.

Gratuities: —

Harvard Botanic Garden, *Toxicophlaea spectabilis* 2 00
James E. Rothwell, *Cattleya Trianaei* var. *Backhousiana* . . 1 00
Mrs. E. M. Gill, Display 2 00
James Comley, " 2 00

FEBRUARY 25.

Gratuities: —

James Comley, Display 3 00
Mrs. E. M. Gill, " 2 00

MARCH 4.

Gratuity: —

James Comley, Display 3 00

MARCH 11.

Gratuity: —

Mrs. E. M. Gill, Display 2 00

MARCH 18.

Gratuity: —

R. McMillan, Vase of Mignonette 1 00

SPRING EXHIBITION.

MARCH 21, 22, 23, AND 24.

HYBRID PERPETUAL ROSES.— Twelve blooms, in not less than four named varieties:

First, Charles H. Souther 12 00

Six blooms, not less than three named varieties:

First, Charles H. Souther 6 00

Twelve blooms of Ulrich Brunner:

First, John McFarland 10 00

TENDER ROSES IN VASES.— Twenty-five blooms of Bridesmaid:

First, William H. Elliott 12 00

Twenty-five blooms of The Bride:

First, William H. Elliott 12 00
Second, Mrs. B. P. Cheney 10 00

CARNATIONS.— Vase of one hundred cut blooms with foliage, not less than six varieties:

First, M. A. Patten	8 00
Second, William Nicholson	6 00
Third, Mrs. E. M. Gill	4 00
Twenty-five blooms of any named Crimson variety:	
First, M. A. Patten, for Ferdinand Mangold	2 00
Twenty-five blooms of any named Dark Pink variety:	
First, William Nicholson, for Mrs. F. Joost	3 00
Second, M. A. Patten, for Mrs. F. Joost	2 00
Twenty-five blooms of any named Light Pink variety:	
First, William Nicholson, for Daybreak	3 00
Second, Mrs. E. M. Gill, for Daybreak	2 00
Twenty-five blooms of any named Scarlet variety:	
First, M. A. Patten, for Bon Ton	3 00
Twenty-five blooms of any named White variety:	
First, William Nicholson, for White Cloud	3 00
Second, William Nicholson, for Eureka	2 00
Twenty-five blooms of any named Yellow variety:	
First, William Nicholson, for Eldorado	3 00
Twenty-five blooms of any named White variegated variety:	
First, William Nicholson, for Mrs. G. M. Bradt	4 00
Second, M. A. Patten, for Mrs. G. M. Bradt	3 00

PANSIES.— Forty-eight cut blooms, not less than twenty-four varieties, in flat dishes:

First, Charles H. Souther	3 00

VIOLETS.— Bunch of one hundred blooms of Lady Hume Campbell:

First, H. Dumaresq	3 00
Bunch of one hundred blooms of Marie Louise:	
Second, A. A. Thorndike	2 00
Bunch of one hundred blooms of any other double variety:	
First, W. L. Minor, for The Imperial	3 00
Bunch of one hundred blooms of any other single variety:	
First, Harry S. Rand, for Princess of Wales	3 00
Second, Mrs. John L. Gardner, for La France	2 00

ANTIRRHINUMS.— Display of not less than three varieties:

First, Charles H. Souther	3 00
Second, Mrs. John Jeffries	2 00

Gratuities: —

James Garthley, Cinerarias	2 00
Peter Fisher, Display of Carnations	3 00
Alex. McKay, Display of Roses	2 00
Mrs. E. M. Gill, Basket of Flowers	2 00
James Comley, Display	3 00
Mrs. E. M. Gill, "	1 00

APRIL 1.

Gratuity: —

Edward J. Mitton, Display of Gloxinias 3 00

APRIL 8.

Gratuities: —

E. A. & W. K. Wood, Display of Violets 3 00
James Comley, Display 2 00
Mrs. E. M. Gill, " 1 00

APRIL 15.

Gratuities: —

James Comley, Display 3 00
Mrs. E. M. Gill, " 1 00
Mrs. John Jeffries, Display 1 00

APRIL 22.

Gratuities: —

George Hollis, Display of Geraniums 2 00
James Comley, Display 1 00

APRIL 29.

Gratuities: —

Mrs. John Jeffries, Display of Antirrhinums 1 00
James Comley, Display 3 00
Mrs. E. M. Gill, " 1 00

MAY 6.

TULIPS. — Forty-eight blooms, not less than twelve named varieties:
First, W. N. Craig 4 00
HARDY NARCISSUSES. — Collection of fifty vases of not less than ten named varieties:
First, W. N. Craig 8 00
PANSIES. — Forty-eight blooms, not less than twenty-four varieties, in flat dishes:
First, Mrs. E. M. Gill. 4 00

Gratuities: —

Dr. C. G. Weld, Display of Hardy Narcissuses 4 00
Harvard Botanic Garden, Hardy Herbaceous Plants . . . 4 00
W. S. Eager, Vase of Carnations 1 00
James Comley, Display 5 00
Mrs. E. M. Gill, " 1 00

MAY 13.

Gratuities: —

James Garthley, Display of Geraniums 2 00
James Comley, Display 4 00
Mrs. E. M. Gill, " 1 00

MAY 20.

Gratuities : —

Mrs. H. S. Stanley, Display of Cacti and Roses	1 00
Mrs. E. M. Gill, Display	2 00

MAY 27.

Gratuity : —

Mrs. E. M. Gill, Display	2 00

JUNE 3.

Gratuities : —

H. H. Hunnewell, Display of Rhododendrons	20 00
Mrs. E. M. Gill, Display	1 00

RHODODENDRON EXHIBITION.

JUNE 7 AND 8 (POSTPONED FROM JUNE 1 AND 2).

H. H. Hunnewell Fund.

RHODODENDRONS.— Twelve distinct varieties of unquestioned hardiness, named :

First, James Comley	20 00
Second, Mrs. John L. Gardner	15 00

Six distinct varieties of unquestioned hardiness, named :

First, James Comley	10 00

Six tender varieties, named :

First, Mrs. John L. Gardner	5 00
Second, Mrs. John L. Gardner	4 00

HARDY AZALEAS, FROM ANY OR ALL CLASSES — Fifteen varieties, one vase of each :

First, T. C. Thurlow	8 00

Twelve varieties, one vase of each :

First, T. C. Thurlow	4 00

Cluster of trusses, one variety :

First, T. C. Thurlow	2 00

Society's Prizes.

TREE PÆONIES.— Collection of single and double varieties, named :

First, Mrs. John Jeffries	6 00

GERMAN IRISES.— Thirty-six vases of three trusses each, of not less than twelve varieties :

First, Mrs. John L. Gardner	4 00

HARDY PYRETHRUMS.— Display of thirty bottles, Single and Anemone-flowered :

Second, Rea Brothers	2 00

ORIENTAL POPPIES.—Display:
Second, Mrs. E. M. Gill 2 00
AQUILEGIAS.— Collection, twenty-five vases:
Second, Mrs. John Jeffries 2 00
Third, W. C. Winter 1 00
HARDY ORNAMENTAL TREES AND SHRUBS.— Display of not less than thirty species and varieties, named, cut blooms or foliage:
First, T. C. Thurlow 8 00
Second, Miss Alice L. Grinnell 6 00
VASE OF FLOWERS:
First, Miss Hattie B. Winter 4 00
Second, Mrs. E. M. Gill 3 00

Gratuities: —
H. H. Hunnewell, Rhododendrons 20 00
H. H. Hunnewell, Display of Rhododendrons 10 00
James Comley, Rhododendrons 30 00
Mrs. B. P. Cheney, Rhododendrons 15 00
Mrs. John L. Gardner, Rhododendrons 10 00
F. W. Vanderbilt, Newport, R. I., Rhododendrons 3 00
T. C. Thurlow, Display of Pæonies 8 00
Mrs. John L. Gardner, Display of Pæonies 5 00
George Hollis, Display of Pæonies 2 00
Rea Brothers, Display of Pæonia festiva maxima 1 00
F. S. Davis, Two vases of Pæonies 2 00
Mrs. John Jeffries, German Irises 1 00
Dr. C. G. Weld, Pyrethrums and Aquilegias 8 00
Rea Brothers, Display of Herbaceous Perennials 2 00
Mrs. E. M. Gill, Display 2 00

PÆONY EXHIBITION.

JUNE 10.

HERBACEOUS PÆONIES. — Collection of named varieties, double:
First, Kenneth Finlayson 12 00
Second, T. C. Thurlow 10 00
Collection of named varieties, single:
First, T. C. Thurlow 6 00
Specimen bloom:
First, T. C. Thurlow 2 00
Second, Kenneth Finlayson 1 00
Vase of blooms on long stems, arranged for effect in the Society's large China vases:
First, Mount Vernon Nursery 10 00
Second, Kenneth Finlayson 8 00

Third, T. C. Thurlow	6 00
Fourth, Miss Hattie B. Winter	4 00
Gratuity: —	
Mrs. E. M. Gill, Display	3 00

ROSE AND STRAWBERRY EXHIBITION.

JUNE 22 and 23.

Special Prizes, Theodore Lyman Fund.

HARDY ROSES: — Twenty-four distinct named varieties, three of each variety:	
First, Heirs of Hon. Joseph S. Fay	25 00
Second, Heirs of Hon. Joseph S. Fay	20 00
Third, Heirs of Hon. Joseph S. Fay	15 00

Society's Prizes.

Sixteen named varieties, three of each variety:	
First, Heirs of Hon. Joseph S. Fay	15 00
Twelve named varieties, three of each:	
First, Heirs of Hon. Joseph S. Fay	10 00
Three named varieties, three of each:	
Third, Heirs of Hon. Joseph S. Fay	1 00
Twenty-four blooms of Mme. Gabriel Luizet:	
First, Heirs of Hon. Joseph S. Fay	8 00
Six blooms of Alfred Colomb:	
Second, Heirs of Hon. Joseph S. Fay	2 00
Six blooms of Baroness Rothschild:	
Second, Heirs of Hon. Joseph S. Fay	2 00
Six blooms of John Hopper:	
First, Heirs of Hon. Joseph S. Fay	3 00
Six blooms of Jubilee:	
First, Heirs of Hon. Joseph S. Fay	3 00
Six blooms of Marshall P. Wilder:	
Second, Heirs of Hon. Joseph S. Fay	2 00
Six blooms of Merveille de Lyon:	
Second, Heirs of Hon. Joseph S. Fay	2 00
Six blooms of Mme. Victor Verdier:	
Second, Heirs of Hon. Joseph S. Fay	2 00
Twelve blooms of any other variety:	
First, Heirs of Hon. Joseph S. Fay	4 00
Second, Heirs of Hon. Joseph S. Fay	3 00
Third, Heirs of Hon. Joseph S. Fay	2 00
Best single bloom of any variety:	
First, Heirs of Hon. Joseph S. Fay	2 00

GENERAL DISPLAY.— One hundred bottles of Hardy Roses, buds admissible, each exhibitor limited to one entry:

First, Heirs of Hon. Joseph S. Fay	10 00

BASKET OF ROSES.— Arranged for effect, to be shown the second day:

First, Mrs. E. M. Gill	5 00

SWEET WILLIAMS.— Thirty spikes, not less than six varieties:

First, William C. Winter	4 00
Second, W. N. Craig	3 00
Third, Mrs. John L. Gardner	2 00

Display, eighteen vases of three trusses each:

First, Mrs. John L. Gardner	4 00
Second, W. N. Craig	3 00

VASE OF FLOWERS.— Best arranged:

First, Mrs. E. M. Gill	5 00
Second, William C. Winter	4 00

Gratuities: —

Heirs of Hon. Joseph S. Fay, Display of Roses	30 00
Heirs of Hon. Joseph S. Fay, Display of Roses, Bank	20 00
Heirs of Hon. Joseph S. Fay, Bank of Roses	10 00
Heirs of Hon. Joseph S. Fay, " " "	5 00
Heirs of Hon. Joseph S. Fay, " " "	5 00
Heirs of Hon. Joseph S. Fay, " " "	5 00
Heirs of Hon. Joseph S. Fay, " " "	5 00
Rea Brothers, Display of Perennials	2 00
Mrs. John Jeffries, Foxgloves and Irises	1 00
Kenneth Finlayson, Gloxinias	4 00
James Comley, Display	10 00
Mrs. E. M. Gill, "	8 00
T. C. Thurlow, "	6 00
W. E. Coburn, "	1 00

JULY 1.

HARDY ROSES.— Collection, named, not less than twenty-five varieties filling fifty vases, one rose in each vase:

First, Heirs of Hon. Joseph S. Fay	15 00

IRIS KÆMPFERI.— Six varieties, three of each, in vases:

First, Dr. C. G. Weld	4 00
Second, Mrs. John L. Gardner	3 00

LILIUM CANDIDUM.— Twelve spikes:

Second, Sumner Coolidge	2 00

CAMPANULA MEDIUM.— Collection, not less than fifteen bottles:

Second, Mrs. John L. Gardner	4 00

SWEET WILLIAMS.— Auricula-flowered, thirty spikes of not less than six distinct varieties:

Second, William C. Winter	2 00

DELPHINIUMS.— Collection of twenty spikes, not less than five varieties:

First, Mrs. John L. Gardner	5 00

Display, thirty vases of three spikes each:

First, Mrs. John L. Gardner	6 00

HARDY HERBACEOUS PLANTS.— Thirty bottles:

First, Rea Brothers	8 00
Second, W. N. Craig	6 00

VASE OF FLOWERS:

First, Mrs. E. M. Gill	4 00
Second, Miss Hattie B. Winter	3 00

Gratuities: —

Norris F. Comley, Display of Iris Kæmpferi	2 00
E. S. Converse, Display of Tuberous Begonias	2 00
E. C. Lewis, Display of Hollyhocks	1 00
Heirs of Hon. Joseph S. Fay, Display of Crimson Rambler Roses	3 00
Heirs of Hon. Joseph S. Fay, Display	6 00
W. N. Craig, "	3 00
Rea Brothers, "	2 00

JULY 8.

HOLLYHOCKS.— Double, twelve blooms, of twelve colors, in flat dishes:

Second, Heirs of Hon. Joseph S. Fay	4 00

Double, six blooms, of six colors, in flat dishes:

First, W. N. Craig	3 00
Second, Heirs of Hon. Joseph S. Fay	2 00

Double, twelve spikes:

First, Heirs of Hon. Joseph S. Fay	5 00

PERENNIAL PHLOXES.— Suffruticosa or early-blooming section, collection of named varieties:

First, Rea Brothers	3 00

VASE OF FLOWERS.— Best arranged:

First, Mrs. E. M. Gill	4 00
Second, Miss Hattie B. Winter	3 00

Gratuities: —

L. F. Kinney, *Rhododendron maximum*	1 00
James Comley, " "	1 00
James Comley, *Combretum purpureum*	1 00
Norris F. Comley, *Iris Kæmpferi*	2 00
Heirs of Hon. Joseph S. Fay, Display of Roses	5 00
Rea Brothers, Rose Display	3 00
Heirs of Hon. Joseph S. Fay, Display of Hollyhocks	4 00
Mrs. John L. Gardner, " " "	1 00

W. N. Craig, Display 5 00
Mrs. E. M. Gill, " 1 00
E. C. Lewis, " 1 00

JULY 15.

TUBEROUS BEGONIAS.— Collection, arranged with their own foliage, in flat dishes:
First, H. Dumaresq 4 00
Second, E. S. Converse 3 00
HARDY AQUATIC FLOWERS.— Collection, named:
First, Mrs. John L. Gardner 8 00

Gratuities: —
George F. Sylvester, Hollyhocks 1 00
George Hollis, Ipomœa and Geraniums 1 00
Mrs. John L. Gardner, Drummond Phlox 2 00
Rea Brothers, Hardy Perennials 2 00
Heirs of Hon. Joseph S. Fay, Display 5 00
Mrs. E. M. Gill, " 2 00
W. N. Craig, " 2 00
E. C. Lewis, " 1 00

JULY 22.

HARDY HERBACEOUS PLANTS.— Thirty bottles:
First, W. N. Craig 8 00
Second, Rea Brothers 6 00
Third, Julius Heurlin 4 00
VASE OF FLOWERS.— For table decoration:
First, Miss Hattie B. Winter 4 00

Gratuities: —
W. N. Craig, Display of Sweet Peas and Phlox 3 00
Mrs. E. M. Gill, Display 3 00
George Hollis, " 2 00

JULY 29.

PERENNIAL PHLOXES. — Twelve named varieties, one truss of each:
First, W. N. Craig 3 00
Second, George Hollis 2 00
ANTIRRHINUMS. — Display of thirty vases, three spikes in each, not less than ten varieties:
Second, Edward J. Mitton 3 00
Third, Mrs. John Jeffries 2 00

Gratuities: —
Mrs. John L. Gardner, Phlox 2 00

Rea Brothers, Perennials	2 00
E. C. Lewis, Sweet Peas	1 00
W. N. Craig, Display	3 00
Mrs. E. M. Gill, "	2 00

AUGUST 5.

ANNUALS.— General display, named, filling not less than one hundred and fifty bottles:

First, Mrs. John L. Gardner	10 00
Second, Mrs. E. M. Gill.	8 00
Third, Charles H. Souther	6 00

Gratuities: —

H. H. Hunnewell, Ixora and Rhododendrons	2 00
H. H. Hunnewell, Display of Orchids	5 00
J. Warren Clark, Gladioli	4 00
Rea Brothers, Hardy Phlox in fifty-six varieties	3 00
Mrs. John L. Gardner, Hardy Phlox	2 00
George Hollis, Display of Phlox	1 00
James Comley, " " "	1 00
I. E. Coburn, Display of Pansies	3 00
Hon. C. W. Hoitt, Nashua, N.H., *Lilium auratum* and *L. Batemanniæ*	2 00
Norris F. Comley, Asters	2 00
William C. Winter, Dahlias	3 00
Charles H. Souther, Antirrhinums	1 00
Julius Heurlin, Display	1 00

AUGUST 12.

MONTBRETIA.— Display in vases:

First, Mrs. John L. Gardner	3 00
Second, W. N. Craig	2 00

PERENNIAL PHLOXES.— Eighteen vases of eighteen named varieties, not exceeding three trusses in each vase:

First, Rea Brothers,	5 00
Second, George Hollis	4 00
Third, William C. Winter	3 00

Gratuities: —

William C. Winter, Dahlias	3 00
J. Heurlin, Hardy Herbaceous Perennials	3 00
Rea Brothers, Rudbeckia Golden Glow	2 00
J. Warren Clark, Named Gladioli	2 00
J. Warren Clark, Seedling Gladioli	2 00
Mrs. John L. Gardner, *Lilium tigrinum*	1 00
R. P. Struthers, Display	2 00
Mrs. E. M. Gill, "	2 00
Hon. C. W. Hoitt, "	2 00
James Comley, "	2 00

AUGUST 19.

Theodore Lyman Fund.

AQUATICS.—General Display of Nymphæas, Nelumbiums, Sedges, Papyrus, and other aquatic plants, arranged for effect, to include not less than twenty-five blooms of Nymphæas:

First, Henry A. Dreer Corporation, Philadelphia . . . 25 00

GLADIOLI.—Twenty named varieties in spikes:

First, J. Warren Clark, ... 4 00

Ten named varieties in spikes:

First, J. Warren Clark 3 00

Six named varieties, in spikes:

First, J. Warren Clark 2 00

Display of named and unnamed varieties, filling one hundred vases, arranged for effect, with any foliage:

First, J. Warren Clark 8 00

ASTERS.— Large Flowered, of all classes, fifty vases, not less than twelve varieties, three flowers in each vase:

First, Charles H. Souther 6 00
Second, J. W. Howard 5 00
Third, Norris F. Comley 4 00

Truffaut's Pæony Flowered, thirty blooms, not less than twelve varieties:

Second, Charles H. Souther 3 00
Third, E. S. Converse 2 00

Victoria Flowered, thirty blooms not less than twelve varieties:

First, Charles H. Souther 4 00

HARDY HERBACEOUS PLANTS.— Thirty bottles:

Third, Julius Heurlin 4 00

Gratuities:—

J. Warren Clark, Collection of Gladioli 3 00
J. Warren Clark, Gladioli Seedlings 2 00
William C. Winter, Dahlias 3 00
Lothrop & Higgins, " 3 00
Mrs. J. B. Lawrence, " 2 00
George Hollis, Perennial Phlox 2 00
Mrs. John Jeffries, Lilies and Montbretias 1 00
Hon. C. W. Hoitt, Sweet Peas 1 00
Henry A. Dreer Corporation, New Cannas 2 00
Henry A. Dreer Corporation, Fringed Petunias 1 00
James Comley, Lilies and Tuberoses 1 00
Mrs. J. B. Lawrence, Tropæolums 1 00
Mrs. J. B. Lawrence, Sweet Peas and Pinks 1 00
Norris F. Comley, Collection 2 00
Mrs. John Jeffries, Display 2 00
R. P. Struthers, " 1 00

W. N. Craig, Display 2 00
Mrs. E. M. Gill, " 1 00

AUGUST 26.

Gratuities: —

Lothrop & Higgins, Display of Dahlias 6 00
Mrs. J. B. Lawrence, Gaillardias, Dahlias, and Gladioli . . . 2 00
J. Warren Clark, Seedling Gladioli 2 00
Mrs. E. M. Gill, Display 1 00
I. E. Coburn, " 1 00

ANNUAL EXHIBITION OF PLANTS AND FLOWERS.

AUGUST 30 AND 31.

DAHLIAS. — Show, eighteen blooms, named varieties:
First, Lothrop & Higgins 4 00
Second, William C. Winter 3 00
Fancy, eighteen blooms, named varieties:
First, H. F. Burt 4 00
Second, H. F. Burt 3 00
Cactus, twelve blooms, named varieties:
First, H. F. Burt 4 00
Second, Lothrop & Higgins 3 00
Third, H. F. Burt 2 00
Decorative, twelve blooms, named varieties:
First, Lothrop & Higgins 4 00
Second, H. F. Burt 3 00
Third, H. F. Burt 2 00
Show, Six blooms, named varieties:
First, Lothrop & Higgins 2 00
Second H. F. Burt 1 00
Fancy, Six blooms:
First, Lothrop & Higgins 2 00
Second, H. F. Burt 1 00
Best single bloom, of any class, introduction of 1897 or later:
First, Lothrop & Higgins 1 00
Pompon, twelve vases, of three blooms each, named varieties:
First, William C. Winter 3 00
Second, Lothrop & Higgins 2 00
Third, Lothrop & Higgins 1 00
Single, twelve vases of three blooms each, named varieties:
First, William C. Winter 2 00
Second, William E. Endicott 1 00
General Display, all classes admissible, one hundred or more bottles:
First, H. F. Burt 12 00

Second, William C. Winter 10 00
Third, Lothrop & Higgins 8 00
Fourth, Mount Vernon Nursery 6 00
Fifth, William H. Symonds 4 00

HARDY LILIES.— Collection of not less than four named species:
Second, Sumner Coolidge 4 00

TROPAEOLUMS.— Display with their own foliage, filling twenty-five vases. not over twelve blooms of one variety in each:
First, Mrs. J. W. Cain 3 00
Second, Mrs. E. M Gill 2 00

MARIGOLDS.— Display of French and African, filling twenty-five vases:
First, Mrs. John L. Gardner 3 00
Second, E. C. Lewis 2 00

ZINNIAS.— Fifty double, not less than twelve varieties:
First, E. C. Lewis 3 00
Second, E. C. Lewis 2 00

Fifty single, not less than twelve varieties:
First, A. B. Howard 3 00

VASE OF FLOWERS.— For table decoration, on the last day of the exhibition:
First, Miss Hattie B. Winter 4 00
Second, Mrs. E. M. Gill 3 00

Gratuities: —
Oakes Ames, Aquatics 15 00
Mrs. W. C. Loring, *Lilium auratum* 1 00
Rea Brothers, Perennial Phlox 4 00
Julius Heurlin, Hardy Perennials 3 00
C. Vanderbilt, Newport, R.I., Montbretias, Besseras, and Acidantheras 3 00
Norris F. Comley, China Asters 2 00
James Garthley, Cockscombs 2 00
Schlegel & Fottler, Cannas 2 00
J. Warren Clark, Gladioli 2 00
Rea Brothers, New Perennials 2 00
Mrs. E. M. Gill, Vase of Allamandas 1 00
E. S. Converse, Tuberous Begonias 1 00
James Comley, Display 5 00
Mrs. E. M. Gill, " 1 00

SEPTEMBER 2.

Gratuities: —
Lothrop & Higgins, Display of Dahlias 5 00
Mrs. J. B. Lawrence, Display 2 00

SEPTEMBER 9.

DAHLIAS.— Cactus, twelve blooms, named varieties:
First, H. F. Burt 3 00

Second, H. F. Burt	2 00
Third, Lothrop & Higgins	1 00
HERBACEOUS PERENNIALS.— Thirty bottles:	
First, W. N. Craig	8 00
Second, Julius Heurlin	6 00
Third, Rea Brothers	4 00
Gratuities: —	
H. F. Burt, Dahlias	1 00
William C. Winter, Dahlias	1 00
Lothrop & Higgins, "	1 00
Mrs. George Duncan, Cockscombs	2 00
E. L. Dorr, "	2 00
Rea Brothers, Phlox and Sunflowers	2 00
J. E. Clapp, Chrysanthemum-flowered Sunflower	1 00
E. C. Lewis, Marigolds	1 00
Mrs. E. M. Gill, Display	3 00

SEPTEMBER 16.

PERENNIAL ASTERS.— Collection of Native or Introduced species and varieties:	
First, Mrs. E. M. Gill	5 00
Second, Misses Eleanor and Mollie Doran	4 00
Third, George Hollis	3 00
ORNAMENTAL FRUITED HARDY TREES AND SHRUBS:—	
First, Miss Alice L. Grinnell	8 00
Gratuities: —	
Julius Heurlin, Hardy Perennials	2 00
Mrs. J. B. Lawrence, Dahlias	2 00
F. A. Blake, Begonias	1 00
Henry A. Purdie, Solidagos	1 00
Robert Manning, Display	1 00

SEPTEMBER 23.

Gratuity: —	
Mrs. George Duncan, Display	1 00

SEPTEMBER 28.

Gratuities: —	
H. F. Burt, Display of Dahlias	5 00
Julius Heurlin, Display of Herbaceous Plants	2 00

SEPTEMBER 30.

Gratuities: —	
Lothrop & Higgins, Cactus and Decorative Dahlias	2 00
Mrs. J. B. Lawrence, Dahlias	1 00

CHRYSANTHEMUM SHOW.

NOVEMBER 7, 8, 9, AND 10.

Josiah Bradlee Fund.

CHRYSANTHEMUMS.— Twenty-five blooms of twenty-five distinct varieties, named:

First, Mrs. B. P. Cheney	20 00
Second, Arthur F. Whitin	15 00
Third, Col. Charles Pfaff	10 00

Six vases of six named varieties, ten blooms each:

First, Waban Conservatories	30 00
Second, Norris F. Comley	25 00

Henry A. Gane Memorial Fund.

For the best twelve specimen blooms of any of the Seedling Chrysanthemums originated by the late Henry A. Gane:

First, Waban Conservatories	20 00
Second, Norris Comley	10 00

Society's Prizes.

Twelve cut blooms, Incurved, named, in vases:

First, C. H. Souther	8 00
Second, E. S. Converse	6 00

Twelve cut blooms, Japanese Incurved, named, in vases:

First, Mrs. B. P. Cheney	10 00
Second, Col. Charles Pfaff	6 00
Third, E. S. Converse	4 00

Twelve cut blooms, Anemone, named, in vases:

First, C. H. Souther	8 00
Second, Dr. C. G. Weld	6 00
Third, E. S. Converse	4 00

Six cut blooms, Incurved, named, in vases:

First, Dr. C. G. Weld	5 00
Second, E. S. Converse	4 00
Third, C. H. Souther	2 00

Six cut blooms, Japanese, named, in vases:

First, C. H. Souther	6 00
Second, Mrs. B. P. Cheney	4 00
Third, Edward Whitin	2 00

Six cut blooms, Japanese Incurved, named, in vases:

First, C. H. Souther	6 00
Second, Edward Whitin	4 00
Third, Edward Whitin	2 00

Six cut blooms, Reflexed, named, in vases:
- First, C. H. Souther 6 00
- Second, Mrs. B. P. Cheney 4 00
- Third, E. S. Converse 2 00

Six cut blooms, Anemone, named, in vases:
- First, E. S. Converse 5 00
- Second, John Thomas 4 00
- Third, C. H. Souther 2 00

Twelve sprays, Japanese, naturally grown, stems twenty-four inches or over, not less than six named varieties:
- Second, Norris F. Comley 3 00

Twelve sprays, Pompons, naturally grown, stems twenty-four inches or over, not less than six named varieties:
- First, J. W. Howard 4 00

Twelve best varieties, named, introductions of the current year:
- First, C. H. Souther 8 00
- Second, J. W. Howard 6 00

Vase of ten blooms, on long stems, Pink, named:
- First, Waban Conservatories 10 00
- Second, Mrs. B. P. Cheney 8 00
- Third, Mrs. B. P. Cheney 6 00

Vase of ten blooms, on long stems, Red, named:
- First, Mrs. B. P. Cheney 10 00
- Second, H. Dumaresq 8 00
- Third, E. S. Converse 6 00

Vase of ten blooms, on long stems, White, named:
- First, Waban Conservatories 10 00
- Second, Mrs. B. P. Cheney 8 00
- Third, E. S. Converse 6 00

Vase of ten blooms on long stems, Yellow, named:
- First, Waban Conservatories 10 00
- Second, Mrs. B. P. Cheney 8 00
- Third, Mrs. B. P. Cheney 6 00

Vase of ten blooms, on long stems, any other color, named:
- First, Mrs. B. P. Cheney 10 00
- Second, Mrs. B. P. Cheney 8 00
- Third, Col. Charles Pfaff 6 00

Vase of blooms, on long stems, arranged in the Society's large China vases, to be kept in good condition during the exhibition:
- First, Norris F. Comley 20 00
- Second, Col. Charles Pfaff 18 00
- Third, Mrs. E. M. Gill 16 00
- Fourth, Charles H. Souther 14 00
- Fifth, J. W. Howard 12 00

Gratuities: —

J. W. Howard, Chrysanthemum Glory	3 00
J. W. Howard, Vase of Pompon Chrysanthemums	2 00
I. E. Coburn, Pansies	4 00
Sewell Fisher, Carnation Saxon	1 00
William Nicholson, Carnations	3 00
M. A. Patten, "	3 00
D. Carmichael, "	2 00
John Pritchard, "	2 00
Mrs. B. P. Cheney, Display	10 00
Mrs. E. M. Gill, "	5 00
James Comley, "	4 00
John Thomas, "	3 00
Alexander McKay, "	3 00
Norris Comley, "	2 00
J. W. Howard, "	1 00
Dr. F. S. Williams, "	1 00

NOVEMBER 25.

Gratuities: —

Oakes Ames, Cattleya chocoensis	2 00
Mrs. E. M. Gill, Display	1 00
James Comley, "	1 00

SOCIETY'S SILVER MEDALS.

February 11. James Comley, for *Prunus Pseudo-cerasus*.

Spring Exhibition, March 21. E. L. Marquisee, for Carnation The Marquis.

Rose Exhibition, June 22. Jackson T. Dawson, for *Rosa Wichuraiana* × *R. Indica*.

July 1. M. H. Walsh, for *Rosa Wichuraiana* × Baroness Rothschild.

" 29. Hicks Arnold, for *Cattleya Hardyana*.

" " George McWilliam, for Dipladenia Mrs. George McWilliam.

August 5. Dr. C. G. Weld, for *Watsonia Aderneï*.

" 12. Bayard Thayer, for *Nymphaea Brydonacea elegans*.

" 19. E. J. Shaylor, for Gladioli hybrids.

SOCIETY'S SILVER GILT MEDAL.

July 29. George McWilliam, for Dipladenia George M. Whitin.

SOCIETY'S BRONZE MEDAL.

July 29. George McWilliam, for Dipladenia Miss Lois H. Whitin.

KELWAY SILVER GILT MEDAL.

June 10. Kenneth Finlayson, for eighteen named varieties of *Pæonia albiflora*.

KELWAY BRONZE MEDAL.

June 10. Thomas C. Thurlow, for eighteen named varieties of *Pæonia albiflora* (second prize).

FIRST CLASS CERTIFICATES OF MERIT.

January 21. James E. Rothwell, for *Laelia anceps* var. *Ballentinianum*.
February 4. John N. May, of Summit, N. J., for Carnation Olympia.
Spring Exhibition, March 21. Charles H. Souther, for Rose Carmine Pillar.
March 21. Kenneth Finlayson, for Crested *Cyclamen persicum*.
May 6. J. E. Rothwell, for Superior Culture of *Dendrobium grandiflora*.
Rhododendron Show, June 7. H. Dumaresq, for *Bougainvillea spectabilis*.
Rose Exhibition, June 22. Jackson T. Dawson, for Rose William Egan.
July 8. M. H. Walsh, for *Rosa Wichuraiana* × Bridesmaid.
August 5. James F. Harlow, for Gladiolus Mme. Desbordes-Valmore.
" " James F. Harlow, for Gladiolus Baron Joseph Hulot.
" " J. E. Rothwell, for superior culture of Cypripedium Frau Ida Brandt.
" " J. E. Rothwell, for *Cypripedium* × *Edwardii* var. *superbum superbiens*.
Exhibition of Aquatic Plants, etc., August 19. J. W. Howard, for Giant White Comet Aster.
August 19. J. W. Howard, for Aster Daybreak.
" " Henry A. Dreer Corporation, for *Nymphæa fulva*.
" " Henry A. Dreer Corporation, for *Nymphæa rubra punctata*.
October 28. J. E. Rothwell, for *Cypripedium* × *Brysa Sedenii candidulum* × *Boissierianum*.
November 4. H. A. Wheeler, for *Zygopetalum Mackaii caeruleum*.

HONORABLE MENTION.

January 7. Oakes Ames, for *Cattleya chocoensis alba*.
February 4. John N. May, for Carnation Melba.
April 1. Hon. C. G. Roebling, of Trenton, N. J., for *Cypripedium villosum* var. *giganteum*.
Annual Exhibition of Plants and Flowers, August 30. A. B. Howard, for Verbenas.
August 30. A. B. Howard, for Petunias.
" " James Brydon, for Nymphæa Arethusa.
September 16. F. S. Davis, for *Incarvillea variabilis*.
Chrysanthemum Show, November 7. Dr. F. S. Williams, for Chrysanthemum Bessie Jones.
November 7. Charles S. Cooper, for Carnation Crawford.
" " E. F. Wilson, for Cosmos Klondike.
" " John Cook, for Rose Baltimore.

J. WOODWARD MANNING,
MICHAEL H. NORTON,
KENNETH FINLAYSON,
FREDERICK S. DAVIS,
JAMES COMLEY,
Committee on Flowers.

REPORT

OF THE

COMMITTEE ON FRUITS,

FOR THE YEAR 1899.

By E. W. WOOD, CHAIRMAN.

Owing to the partial failure of the apple crop in 1898, it was hoped by the growers that the trees which had failed to produce the usual crop on the even or bearing year would produce a largely increased quantity of fruit on the present odd calendar year. These hopes have been partially realized, as there have not been for many years so many apples shown at the exhibitions on the off year as during the past season. It would be to the advantage of both grower and consumer if a more even production of this most important fruit could be secured in successive years.

Owing to dry weather or other climatic conditions, fruits, especially late fall and winter varieties, matured earlier than usual, and it has been impossible to keep them under ordinary conditions as in former years.

Pears have been shown in about the usual quantity, but the crop has been below the average. The market has not at any time been oversupplied with good fruit of the desirable varieties.

The exhibitions during the year have been fully up to the average of former years and have been well attended. The Strawberry Exhibition proved one of the most interesting of the year; more new and promising varieties were shown than in any other class of fruits. It is impossible to recommend varieties for general cultivation as they vary so much when grown in different

soils and locations. The safest guide for the grower would seem to be to test the most promising varieties in his own field or garden.

With the exception of Strawberries few new fruits have been shown deserving special mention. J. S. Chase and E. J. Recanco showed several varieties of seedling grapes, some of good quality — but the size and appearance of the bunches did not compare favorably with varieties in general cultivation.

The dry season was unfavorable for fungous growth and there was little injury to pears from cracking; several dishes of the Flemish Beauty were shown possessing all their former merit in size and appearance.

There has been awarded during the year in prizes and gratuities sixteen hundred and sixteen dollars, leaving an unexpended balance of one hundred and sixteen dollars.

E. W. WOOD, *Chairman.*

PRIZES AND GRATUITIES AWARDED FOR FRUITS.

1899.

SPRING EXHIBITION.

MARCH 21, 22, 23, AND 24.

WINTER APPLES.— Baldwin:	
First, C. F. Boyden	$3 00
Second, E. M. Bruce	2 00
Third, H. R. Kinney	1 00
Northern Spy:	
First, George V. Fletcher	3 00
Second, William O'Connell	2 00
Third, E. M. Bruce	1 00
Roxbury Russet:	
First, H. R. Kinney	3 00
Second, George V. Fletcher	2 00
Third, Joshua C. Stone	1 00
Tompkins King:	
First, George C. Rice	3 00
Second, F. J. Kinney	2 00
Third, C. L. Hartshorn	1 00
Any other variety:	
First, H. R. Kinney, Peck's Pleasant	3 00
Second, George C. Rice, Sutton Beauty	2 00
Third, George V. Fletcher, Fletcher Russet	1 00
WINTER PEARS.— Any variety:	
First, Warren Fenno, Duchess of Bordeaux	3 00
Second, A. T. Brown, Easter Beurré	2 00
STRAWBERRIES.— One pint:	
First, Francis Blake	3 00

APRIL 1.

Gratuity: —

Francis Blake, Strawberries	1 00

JUNE 7.

Gratuities: —

Warren Heustis & Son, Strawberries	1 00
William C. Winter, Peaches	1 00
H. R. Kinney, Apples	1 00

ROSE AND STRAWBERRY EXHIBITION.

JUNE 22 AND 23.

Special Prizes from the Theodore Lyman Fund.

STRAWBERRIES.— Four quarts of any variety:

First, Warren Heustis & Son, Marshall	20 00
Second, Benjamin M. Smith, Nick Ohmer	16 00
Third, Sumner Coolidge, Marshall	12 00
Fourth, George V. Fletcher, "	10 00
Fifth, Warren Heustis & Son, Belmont	8 00

Special Prizes offered by the Society.

Two quarts of any variety best adapted for garden cultivation for home use, to be judged by points:

First, Warren Heustis & Son, Marshall	6 00
Second, George V. Fletcher, "	5 00
Third, William C. Winter, Gen. Appleton	4 00
Fourth, I. E. Coburn, Belmont	3 00

Regular Prizes.

For the largest and best collection, not less than fifteen baskets of two quarts each, and not less than five varieties:

First, George F. Wheeler	20 00

Ten baskets, two quarts each, not less than three varieties:

First, Warren Heustis & Son	15 00
Second, George V. Fletcher	12 00
Third, George F. Wheeler	10 00
Fourth, I. E. Coburn	8 00

Two quarts of Belmont:

First, I. E. Coburn	4 00
Second, George V. Fletcher	3 00
Third, Warren Heustis & Son	2 00

Bubach:

First, George V. Fletcher	4 00
Second, I. E. Coburn	3 00
Third, Warren Heustis & Son	2 00

Clyde:

First, Levi Doran & Son	4 00
Second, Warren Heustis & Son	3 00
Third, George V. Fletcher	2 00

Crescent:

Second, I. E. Coburn	3 00
Third, William C. Winter	2 00

Enormous:	
First, George F. Wheeler	4 00
Second, George V. Fletcher	3 00
Havérland:	
First, I. E. Coburn	4 00
Second, George F. Wheeler	3 00
Hersey:	
First, George F. Wheeler	4 00
Second, Sumner Coolidge	3 00
Jessie:	
First, William C. Winter	4 00
Second, I. E. Coburn	3 00
Third, George V. Fletcher	2 00
Margaret:	
First, Benjamin M. Smith	4 00
Second, George F. Wheeler	3 00
Marshall:	
First, Sumner Coolidge	4 00
Second, Warren Heustis & Son	3 00
Third, George V. Fletcher	2 00
Miner's Prolific:	
First, George F. Wheeler	4 00
Parker Earle:	
First, I. E. Coburn	4 00
Second, George F. Wheeler	3 00
Sharpless:	
Third, George F. Wheeler	2 00
Any other variety:	
First, Samuel H. Warren, Seedling	4 00
Second, George V. Fletcher, Glen Mary	3 00
Third, Sumner Coolidge, Brandywine	2 00
Collection of not less than six varieties, one quart each:	
First, George F. Wheeler	8 00
Second, George V. Fletcher	6 00
One quart of any new variety not previously exhibited:	
First, Samuel H. Warren, Seedling	5 00
Second, John C. Haskell, "	4 00
CHERRIES.— Two quarts of any variety:	
First, Miss Ellen W. Rumrill	4 00
Second, George V. Fletcher	3 00
Third, O. R. Robbins	2 00
FOREIGN GRAPES.— Two bunches of any variety:	
First, E. S. Converse	6 00
Second, E. S. Converse	4 00
FORCED PEACHES.— Six specimens:	
First, William C. Winter, Hale's Early	3 00
Second, William C. Winter, Waterloo	2 00

JULY 1.

STRAWBERRIES.— Any variety:

First, Sumner Coolidge, Marshall	4 00
Second, Warren Heustis & Son, Marshall	3 00
Third, Samuel H. Warren, Seedling	2 00

CHERRIES.— Black Eagle:

First, Charles B. Travis	3 00
Second, E. S. Converse	2 00
Third, F. W. Damon	1 00

Black Tartarian:

First, George V. Fletcher	3 00
Second, O. R. Robbins	2 00
Third, James L. Duncan	1 00

Coe's Transparent:

First, Charles S. Smith	3 00
Second, John L. Bird	2 00

Downer:

First, Charles S. Smith	3 00
Second, M. W. Chadbourne	2 00
Third, A. T. Brown	1 00

Any other variety:

First, Charles S. Smith, Hyde's Seedling	3 00
Second, Miss Vera Chapelle, Napoleon	2 00
Third, J. H. Fletcher, Royal Ann	1 00

JULY 8.

RASPBERRIES.— Two quarts of any variety:

First, E. C. Lewis	3 00

CURRANTS.— Two quarts of any Red variety:

First, W. N. Craig, Versaillaise	4 00
Second, Mrs. E. M. Gill, Versaillaise	3 00
Third, W. N. Craig, Fay's	2 00
Fourth, William O'Connell, Versaillaise	1 00

Two quarts of any White variety:

First, H. R. Kinney	3 00
Second, W. N. Craig	2 00
Third, Mrs. John Jeffries	1 00

GOOSEBERRIES.— Two quarts of any American variety:

First, W. N. Craig, Columbus	4 00
Second, W. G. Kendall, Bates	3 00
Third, W. N. Craig, Triumph	2 00
Fourth, Joseph S. Chase, Triumph	1 00

Gratuity: —

Charles S. Smith, Hyde's Seedling Cherries	1 00

JULY 15.

RASPBERRIES.— Two quarts of any variety:

First, Mrs. E. J. Cutter, Cuthbert	3 00
Second, Sumner Coolidge	2 00
Third, E. C. Lewis	1 00

CURRANTS.— One quart of any Red variety:

First, W. N. Craig, Versaillaise	3 00
Second, W. N. Craig, Fay's	2 00
Third, Mrs. E. M. Gill, Versaillaise	1 00

One quart of any White variety:

First, W. N. Craig, White Grape	2 00
Second, E. N. Horne, Dana's Transparent	1 00

GOOSEBERRIES.— Two quarts of any Foreign variety:

First, W. G. Kendall, Industry	4 00
Second, W. N. Craig, "	3 00
Third, George L. Brown, White Smith	2 00

JULY 22.

BLACKBERRIES.— Two quarts of any variety:

First, Sumner Coolidge	3 00
Second, M. W. Chadbourne	2 00
Third, Rev. Calvin Terry	1 00

APPLES.— Tetofsky:

First, Samuel Hartwell	3 00
Second, Joseph S. Chase	2 00

PEARS.— Summer Doyenne:

First, E. S. Converse	3 00
Second, David L. Fiske	2 00
Third, Sumner Coolidge	1 00

PEACHES.— Six of any variety:

First, William C. Winter	3 00

Gratuities: —

Mrs. John L. Gardner, Nectarines	1 00
W. N. Craig, Currants and Gooseberries	2 00

JULY 29.

APPLES.— Red Astrachan:

First, F. W. Damon	3 00
Second, Samuel Hartwell	2 00
Third, S. F. & F. L. Weston	1 00

Sweet Bough:

First, Sumner Coolidge	3 00
Second, George V. Fletcher	2 00
Third, Charles B. Travis	1 00

Any other variety:
First, Sumner Coolidge, Williams 3 00
Second, Joshua C. Stone, " 2 00
Third, Hittinger Brothers, " 1 00

PEARS.— Giffard:
First, A. T. Brown 3 00
Second, John L. Bird 2 00
Third, F. W. Damon 1 00

Any other variety:
First, A. T. Brown, Clapp's Favorite 3 00
Second, Sumner Coolidge, Clapp's Favorite 2 00
Third, Hittinger Brothers, Wilder 1 00

BLACKBERRIES.— Two quarts of any variety:
First, Sumner Coolidge 3 00
Second, M. W. Chadbourne 2 00
Third, Rev. Calvin Terry 1 00

PEACHES. — Open culture:
First, Sumner Coolidge, Hale's Early 3 00
Second, George H. Sherwin, Hale's Early 2 00
Third, Mrs. N. D. Harrington, Alexander 1 00

Gratuity: —
William H. Monroe, Gooseberries 1 00

AUGUST 5.

APPLES — Oldenburg:
First, Sumner Coolidge 3 00
Second, John L. Bird 2 00
Third, J. V. Fletcher 1 00

Any other variety:
First, Sumner Coolidge, Williams 3 00
Second, Hittinger Brothers, " 2 00
Third, Joshua C. Stone, " 1 00

PEARS.— Clapp's Favorite:
First, A. T. Brown 3 00
Second, Sumner Coolidge 2 00
Third, M. W. Chadbourne 1 00

Any other variety:
First, A. T. Brown, Giffard 2 00
Second, Warren Fenno, " 1 00

PEACHES.— Twelve specimens of outdoor culture, any variety:
First, Sumner Coolidge, Rivers 3 00
Second, George H. Sherwin, Hale's Early 2 00
Third, Mrs. N. D. Harrington 1 00

Six specimens of cold house culture:
First, William C. Winter, Crawford's Early 3 00
Second, William C. Winter, Crawford's Late 2 00

BLACKBERRIES.— Two quarts of any variety:

First, Sumner Coolidge,	Dorchester	3 00
Second, M. W. Chadbourne,	"	2 00
Third, Rev. Calvin Terry,	"	1 00

PLUMS.— Japanese, any variety:

First, Hittinger Brothers,	Abundance	3 00
Second, Sumner Coolidge,	"	2 00
Third, Hon. Aaron Low,	"	1 00

FOREIGN GRAPES.— Two bunches of any variety:

First, E. S. Converse, Black Hamburg	5 00
Second, William C. Winter, Black Hamburg	4 00

Gratuity: —

Jackson T. Dawson, Nebraska Sand Cherry	1 00

AUGUST 12.

APPLES.— Chenango:

First, Sumner Coolidge	3 00
Second, Charles F. Curtis	2 00

Summer Pippin:

First, Warren Fenno	3 00
Second, Samuel Hartwell	2 00

Williams:

First, Hittinger Brothers	3 00
Second, Sumner Coolidge	2 00
Third, Joshua C. Stone	1 00

Any other variety:

First, Mrs. O. Underwood	3 00
Second, Hittinger Brothers	2 00
Third, Joshua C. Stone	1 00

PEARS.— Rostiezer:

First, Sumner Coolidge	3 00
Second, M. W. Chadbourne	2 00
Third, A. T. Brown	1 00

Tyson:

First, John L. Bird	3 00
Second, Warren Fenno	2 00

Any other variety:

First, Sumner Coolidge	3 00
Second, A. T. Brown	2 00
Third, J. Cunning	1 00

PEACHES.— Any variety:

First, Sumner Coolidge	3 00
Second, W. N. Craig	2 00
Third, George H. Sherwin	1 00

PLUMS, JAPANESE.— Abundance:

First, E. C. Lewis	3 00
Second, Butler & Jewell, Cromwell, Conn.	2 00
Third, Hittinger Brothers	1 00
Burbank:	
First, Butler & Jewell	3 00
Second, Hittinger Brothers	2 00
Third, Sumner Coolidge	1 00
Any other variety:	
First, George V. Fletcher	3 00
Second, Butler & Jewell, Berckmans	2 00
Third, Butler & Jewell, Satsuma	1 00
Gratuity: —	
William C. Winter, Peaches	1 00

AUGUST 19.

APPLES.— Gravenstein:

First, Joshua C. Stone	3 00
Second, Sumner Coolidge	2 00
Third, Hittinger Brothers	1 00
Maiden's Blush:	
First, Joshua C. Stone	3 00
Second, Mrs. O. Underwood	2 00
Porter:	
First, Sumner Coolidge	3 00
Second, Joshua C. Stone	2 00
Third, Charles S. Smith	1 00
Any other variety:	
First, Hittinger Brothers, Williams	3 00
Second, Joshua C. Stone "	2 00
Third, Sumner Coolidge, Bietigheimer	1 00

PEARS.— Andrews:

First, E. S. Converse	3 00
Second, Joshua C. Stone	2 00
Bartlett:	
First, A. T. Brown	3 00
Second, J. Cunning	2 00
Third, Sumner Coolidge	1 00
Any other variety:	
First, A. T. Brown, Clapp's Favorite	3 00
Second, Sumner Coolidge, Clapp's Favorite	2 00
Third, J. B. Beley, " "	1 00

PEACHES.— Single dish of any variety:

First, Sumner Coolidge	3 00
Third, George L. Brown	1 00

PLUMS.— Bradshaw:

First, George V. Fletcher	3 00
Second, H. R. Kinney	2 00
Third, M. W. Chadbourne	1 00

Any other variety:

First, Butler & Jewell, Cromwell, Conn., Abundance	3 00
Second, E. C. Lewis. Abundance	2 00
Third, Butler & Jewell, Burbank	1 00

NATIVE GRAPES.— Six bunches of Winchell or Green Mountain:

First, H. R. Kinney	3 00
Second, Joseph S. Chase	2 00

Gratuities: —

Miss Ellen W. Rumrill, Crab Apples	1 00
William C. Winter, Peaches	1 00

AUGUST 26.

Gratuity: —

Joseph S. Chase, Native Grapes	1 00

ANNUAL EXHIBITION OF PLANTS AND FLOWERS.

AUGUST 30 AND 31.

Special Prizes from the Theodore Lyman Fund.

FOREIGN GRAPES.— For the heaviest and best ripened bunch of any Foreign Black Grape:

First, George McWilliam	15 00
Second, Miss E. J. Clark	10 00

For the heaviest and best ripened bunch of any Foreign White Grape, Syrian excluded:

First, Mrs. R. M. Clark	15 00

Society's Prizes.

FOREIGN GRAPES.— Black Alicante:

First, Miss E. J. Clark	5 00
Second, J. C. Whitin	4 00

Black Hamburg:

First, Miss E. J. Clark	5 00
Second, Daniel Brown	4 00
Third, William C. Winter	3 00

Lady Downes:

First, Mrs. J. C. Whitin	5 00

Muscat of Alexandria:

First, George McWilliam	5 00
Second, E. J. Bernard	4 00
Third, Miss E. J. Clark	3 00

Any other variety:
First, Mrs. R. M. Clark, Bowood Muscat 5 00
Second, Mrs. J. C. Whitin, Madresfield Court 4 00
Third, Mrs. J. C. Whitin, Golden Queen 3 00

Gratuities: —
F. W. Damon, Moore's Early Grapes 1 00
William C. Winter, Peaches 2 00

SEPTEMBER 9.

APPLES. — Gravenstein:
First, Charles S. Smith 3 00
Second, William Christie 2 00
Third, Sumner Coolidge 1 00
Maiden's Blush:
Second, H. R. Kinney 2 00
Porter:
First, M. W. Chadbourne 3 00
Second, Sumner Coolidge 2 00
Third, Joshua C. Stone 1 00
Washington Strawberry:
First, Sumner Coolidge 3 00
Second, Joshua C. Stone 2 00
Third, Hittinger Brothers 1 00
Any other variety:
First, C. L. Hartshorn, Sterling 3 00
Second, L. P. Rollins, New York Pippin 2 00
Third, Joshua C. Stone, " " 1 00
CRAB APPLES. — Transcendent:
First, L. J. Fosdick 2 00
Second, Mrs. O. Underwood 1 00
Any other variety:
First, M. W. Chadbourne, Hyslop 2 00
Second, C. L. Hartshorn, " 1 00
PEARS. — Bartlett:
First, William Milman 3 00
Second, A. T. Brown 2 00
Third, J. Cunning 1 00
Belle Lucrative:
First, E. S. Converse 3 00
Second, A. T. Brown 2 00
Third, F. J. Kinney 1 00
Boussock:
First, Sumner Coolidge 3 00
Second, Charles F. Curtis 2 00
Third, M. W. Chadbourne 1 00

Hardy:	
Second, Warren Fenno	2 00
Paradise of Autumn:	
First, Warren Fenno	3 00
Souvenir du Congrès:	
First, A. T. Brown	3 00
Second, Warren Fenno	2 00
Third, Sumner Coolidge	1 00
Any other variety:	
First, A. T. Brown, Louise Bonne of Jersey	3 00
Second, A. T. Brown, De Tongres	2 00
Third, C. E. Richardson, Flemish Beauty	1 00
PEACHES.— Coolidge's Favorite:	
First, Sumner Coolidge	3 00
Crawford's Early:	
First, A. A. Bradshaw	3 00
Second, W. N. Craig	2 00
Third, Sumner Coolidge	1 00
Crosby:	
Second, John Parker	2 00
Third, Sumner Coolidge	1 00
Foster:	
First, Charles F. Curtis	3 00
Second, Sumner Coolidge	2 00
Oldmixon Freestone:	
First, Sumner Coolidge	3 00
Second, Charles F. Curtis	2 00
Third, C. E. Swain	1 00
Stump the World:	
First, L. M. Chase	3 00
Second, Sumner Coolidge	2 00
PEACHES, ORCHARD HOUSE CULTURE.— Any variety:	
First, William C. Winter	4 00
PLUMS.— Imperial Gage:	
First, George V. Fletcher	3 00
Lombard:	
First, H. R. Kinney	3 00
Second, E. C. Lewis	2 00
Third, W. Warburton	1 00
Any other variety:	
First, Sumner Coolidge, Yellow Egg	3 00
Second, H. R. Kinney, Bradshaw	2 00
Third, John Parker, Golden Egg	1 00
Japanese, any variety:	
First, E. C. Lewis	3 00

NATIVE GRAPES.— Eumelan:	
First, Joseph S. Chase	3 00
Massasoit:	
First, H. R. Kinney	3 00
Second, F. J. Kinney	2 00
Third, Joseph S. Chase	1 00
Moore's Early:	
First, H. R. Kinney	3 00
Second, F. W. Damon	2 00
Third, William Christie	1 00
Any other variety:	
First, H. R. Kinney, Worden	3 00
Second, H. R. Kinney, Moore's Diamond	2 00
Third, F. J. Kinney, Worden	1 00
Any variety from girdled vines:	
First, F. J. Kinney, Brighton	3 00
Second, H. R. Kinney, Worden	2 00
Third, H. R. Kinney, Delaware	1 00
Gratuity: —	
Herbert Dumaresq, Foreign Grapes	3 00

ANNUAL EXHIBITION OF FRUITS AND VEGETABLES.

SEPTEMBER 28 AND 29.

Special Prizes.

Samuel Appleton Fund.

APPLES.— Baldwin, Joshua C. Stone	5 00
Hubbardston, Joshua C. Stone	5 00
PEARS.— Bosc, A. T. Brown	5 00
Sheldon, A. T. Brown	5 00

Benjamin V. French Fund.

APPLES.— Gravenstein, C. F. Boyden	5 00
Rhode Island Greening, Joshua C. Stone	5 00

Marshall P. Wilder Fund.

PEARS.— Anjou:	
First, George V. Fletcher	4 00
Second, William Milman	3 00
Third, A. T. Brown	2 00
Fourth, F. W. Damon	1 00
Bartlett:	
First, George V. Fletcher	4 00
Second, Varnum Frost	3 00

Third, A. T. Brown	2 00
Fourth, M. W. Chadbourne	1 00
NATIVE GRAPES.— Twelve bunches of Concord:	
First, C. T. Hayward	4 00
Second, E. A. Adams	3 00
Third, H. R. Kinney	2 00
Fourth, W. D. Hinds	1 00
Twelve bunches of Worden:	
First, E. A. Adams	4 00
Second, F. J. Kinney	3 00
Third, H. R. Kinney	2 00
Fourth, Joseph S. Chase	1 00

Theodore Lyman Fund.

APPLES.— Baldwin:	
First, Joshua C. Stone	4 00
Second, C. F. Boyden	3 00
Third, F. W. Damon	2 00
Fall Orange:	
First, Charles S. Smith	3 00
Second, Charles T. Foster	2 00
Fameuse:	
First, H. Whittaker	3 00
Second, William Milman	2 00
Fletcher Russet:	
First, Charles F. Curtis	3 00
Gravenstein:	
First, C. F. Boyden	4 00
Second, Mrs. A. S. Underwood	3 00
Third, Charles S. Smith	2 00
Hubbardston:	
First, C. F. Boyden	4 00
Second, H. E. Rich	3 00
Third, Joshua C. Stone	2 00
Hunt Russet:	
First, C. F. Boyden	3 00
Third, W. H. Teele	1 00
Mackintosh:	
First, Edwin C. Stone	4 00
Second, Charles F. Curtis	3 00
Third, C. M. Handley	2 00
Maiden's Blush:	
Second, Warren Fenno	2 00
Mother:	
First, O. B. Hadwen	3 00
Third, George C. Rice	1 00

Northern Spy:	
First, C. H. Thomas	3 00
Second, William O'Connell	2 00
Third, Warren Fenno	1 00
Porter:	
First, Mrs. A. S. Underwood	3 00
Second, Edwin C. Stone	2 00
Third, Charles S. Smith	1 00
Pound Sweet:	
First, George V. Fletcher	3 00
Rhode Island Greening:	
First, Pliny Moore	4 00
Second, Joshua C. Stone	3 00
Third, C. L. Hartshorn	2 00
Roxbury Russet:	
First, Joshua C. Stone	4 00
Second, C. L. Hartshorn	3 00
Third, Warren Fenno	2 00
Sutton:	
First, C. L. Hartshorn	3 00
Third, Charles T. Foster	1 00
Tolman's Sweet:	
First, Mrs. A. S. Underwood	3 00
Second, W. F. Davidson	2 00
Tompkins King:	
First, C. F. Boyden	3 00
Second, George C. Rice	2 00
Third, Elliott Moore	1 00
Palmer:	
First, E. M. Bruce	3 00
Second, C. F. Boyden	2 00
Third, O. B. Hadwen	1 00
Any other variety:	
First, John Parker, Yellow Bellflower	3 00
Second, A. T. Brown, New York Pippin	2 00
Third, C. H. Thomas, Fallawater	1 00
CRAB APPLES.— Hyslop:	
First, W. E. Allen	2 00
Second, J. L. Richardson	1 00
Any other variety:	
First, Samuel H. Warren, Whitney	2 00

Special Prizes offered by the Society.

PEARS.— Anjou, A. T. Brown	5 00
Seckel, A. T. Brown	5 00
PEACHES.— Any variety, W. D. Hinds	5 00
NATIVE GRAPES.— Twelve bunches of any variety, H. R. Kinney	5 00

Regular Prizes.

PEARS.— Angouleme:

First, A. T. Brown	4 00
Second, William O'Connell	3 00
Third, Warren Fenno	2 00

Bosc:

First, E. S. Converse	4 00
Second, A. T. Brown	3 00
Third, S. F. & F. L. Weston	2 00
Fourth, Charles F. Curtis	1 00

Clairgeau:

First, E. J. Recanco	3 00
Second, F. W. Damon	2 00
Third, Charles F. Curtis	1 00

Comice:

First, A. T. Brown	3 00
Second, J. Cunning	2 00
Third, Leverett M. Chase	1 00

Dana's Hovey:

First, A. T. Brown	4 00
Second, F. W. Damon	3 00
Third, J. Cunning	2 00
Fourth, C. E. Swain	1 00

Diel:

First, A. T. Brown	3 00
Second, C. E. Swain	2 00
Third, J. Cunning	1 00

Fulton:

First, E. S. Converse	3 00
Second, S. F. & F. L. Weston	2 00
Third, Warren Fenno	1 00

Hardy:

First, Samuel Hartwell	3 00
Second, Charles F. Curtis	2 00
Third, Leverett M. Chase	1 00

Howell:

First, E. W. Wood	3 00
Second, J. E. Fuller	2 00
Third, John J. Merrill	1 00

Josephine of Malines:

First, Warren Fenno	3 00
Second, John L. Bird	2 00

Lawrence:

First, A. T. Brown	3 00
Second, Warren Frost	2 00
Third, William S. Janvrin	1 00

Louise Bonne of Jersey:	
First, Mrs. James McCormick	3 00
Second, C. E. Richardson	2 00
Third, Mrs. N. D. Harrington	1 00
Marie Louise:	
First, C. E. Swain	3 00
Second, E. A. Hall	2 00
Third, Warren Fenno	1 00
Merriam:	
First, F. W. Damon	3 00
Second, Charles F. Curtis	2 00
Third, C. H. Plimpton	1 00
Onondaga:	
First, Charles B. Travis	3 00
Second, Warren Fenno	2 00
Third, John L. Bird	1 00
Seckel:	
First, A. T. Brown	4 00
Second, J. Cunning	3 00
Third, S. S. Hovey	2 00
Fourth, Mrs. N. D. Harrington	1 00
Sheldon:	
First, Mrs. Arthur C. Wiggin	4 00
Second, A. T. Brown	3 00
Third, G. E. Freeman	2 00
Fourth, George V. Fletcher	1 00
St. Michael Archangel:	
First, Benjamin P. Ware	3 00
Second, Warren Fenno	2 00
Third, Warren Heustis & Son	1 00
Superfin:	
First, Herbert Coolidge	3 00
Second, F. W. Damon	2 00
Third, Leverett M. Chase	1 00
Urbaniste:	
First, E. S. Converse	3 00
Second, A. T. Brown	2 00
Third, John L. Bird	1 00
Vicar:	
First, E. S. Converse	3 00
Second, A. T. Brown	2 00
Third, E. A. Hall	1 00
Winter Nelis:	
First, A. T. Brown	3 00
Second, J. Cunning	2 00
Third, E. A. Hall	1 00

Any other variety:	
First, Mrs. James McCormick, Flemish Beauty	3 00
Second, E. J. Recanco, President	2 00
Third, A. T. Brown, De Tongres	1 00
QUINCES.— Champion:	
First, Charles S. Smith	3 00
Second, E. M. Bruce	2 00
Third, George V. Fletcher	1 00
Orange:	
First, Arthur F. Coolidge	3 00
Second, J. S. Richardson	2 00
Third, George V. Fletcher	1 00
Pear:	
First, George V. Fletcher	3 00
Second, George L. Brown	2 00
Rea:	
First, Warren Fenno	3 00
Any other variety:	
First, H. O. Bates, Meech	3 00
Second, Joseph S. Chase, Meech	2 00
PEACHES.— Crawford's Late:	
First, W. N. Craig	3 00
Second, H. R. Kinney	2 00
Third, E. M. Bruce	1 00
Any other variety:	
First, W. D. Hinds, Crosby	3 00
Second, Benjamin M. Smith, Elberta	2 00
Third, W. N. Craig, Stump the World	1 00
Orchard house culture, any variety:	
First, William C. Winter	4 00
PLUMS.— Yellow Egg:	
First, George V. Fletcher	2 00
Any other variety:	
First, H. R. Kinney, Lombard	2 00
NATIVE GRAPES.— Brighton:	
First, E. A. Adams	3 00
Second, Joseph S. Chase	2 00
Third, Charles W. Libby	1 00
Delaware:	
First, H. R. Kinney	3 00
Second, Joseph S. Chase	2 00
Third, Warren Fenno	1 00
Herbert:	
First, Charles W. Libby	3 00
Second, Joseph S. Chase	2 00
Third, E. A. Adams	1 00

Iona:	
First, Joseph S. Chase	3 00
Second, F. W. Damon	2 00
Lindley:	
First, H. R. Kinney	3 00
Niagara:	
First, E. A. Adams	3 00
Second, C. F. Hayward	2 00
Third, Joseph S. Chase	1 00
Pocklington:	
First, Joseph S. Chase	4 00
Second, Charles W. Libby	3 00
Third, F. W. Damon	2 00
Fourth, H. R. Kinney	1 00
Prentiss:	
First, J. Cunning	3 00
Second, A. T. Brown	2 00
Third, Estate of Benjamin G. Smith	1 00
Wilder:	
First, E. A. Adams	3 00
Second, F. J. Kinney	2 00
Any other variety:	
First, E. A. Adams, Campbell's Early	3 00
Second, Charles W. Libby, Moore's Diamond	2 00
Third, H. R. Kinney, " "	1 00
Any variety from girdled vines:	
First, H. R. Kinney, Concord	3 00
Second, F. J. Kinney, Pocklington	2 00
FOREIGN GRAPES.— Two bunches of any variety, cold house culture:	
First, Daniel Brown, Bowood Muscat	5 00
Second, Daniel Brown, Alicante	4 00
CRANBERRIES.— Half-peck:	
First, L. J. Fosdick	3 00
Second, L. J. Fosdick	2 00
Third, L. J. Fosdick	1 00
Gratuities:—	
Sumner Coolidge, Display	15 00
E. M. Bruce, Edible Nuts	1 00
W. D. Hinds, " "	1 00
C. L. Hartshorn, " "	1 00

OCTOBER 21.

Gratuity:—	
Joseph S. Chase, Quinces	2 00

EXHIBITION OF WINTER FRUITS AND VEGETABLES.

NOVEMBER 18.

Benjamin V. French Fund.

APPLES.— Baldwin, C. F. Boyden	5 00
Rhode Island Greening, Mrs. A. S. Underwood	5 00

Society's Prizes.

APPLES.— Baldwin:	
First, J. W. Clark	3 00
Second, M. W. Chadbourne	2 00
Third, George C. Rice	1 00
Fletcher Russet:	
Second, Charles F. Curtis	2 00
Hubbardston:	
First, J. W. Clark	3 00
Second, C. F. Boyden	2 00
Third, John Parker	1 00
Hunt Russet:	
First, C. F. Boyden	3 00
Third, Rev. Calvin Terry	1 00
Northern Spy:	
First, E. C. Stone	3 00
Second, Warren Fenno	2 00
Third, George V. Fletcher	1 00
Rhode Island Greening:	
First, George V. Fletcher	3 00
Second, Mrs. E. M. Gill	2 00
Third, C. L. Hartshorn	1 00
Roxbury Russet:	
First, C. F. Boyden	3 00
Second, C. L. Hartshorn	2 00
Third, Joshua C. Stone	1 00
Tolman's Sweet:	
First, Mrs. A. S. Underwood	3 00
Tompkins King:	
First, George C. Rice	3 00
Any other variety:	
First, Mrs. A. S. Underwood, Yellow Bellflower	3 00
Second, John Parker, Yellow Bellflower	2 00
Third, C. F. Boyden	1 00
PEARS.— Angouleme:	
First, F. W. Damon	4 00
Second, Warren Fenno	3 00

Anjou:
- First, William Milman 4 00
- Second, A. T. Brown 3 00
- Third, A. K. Gould 2 00
- Fourth, J. Cunning 1 00

Clairgeau:
- First, F. W. Damon 3 00
- Second, Warren Fenno 2 00
- Third, Charles F. Curtis 1 00

Comice:
- First, A. T. Brown 4 00
- Second, J. Cunning 3 00
- Third, Warren Fenno 2 00
- Fourth, M. W. Chadbourne 1 00

Dana's Hovey:
- First, F. W. Damon 4 00
- Second, A. T. Brown 3 00
- Third, J. Cunning 2 00
- Fourth, George V. Fletcher 1 00

Diel:
- First, M. W. Chadbourne 5 00
- Second, C. E. Swain 2 00

Glout Morceau:
- First, E. A. Hall 3 00
- Second, Mrs. A. A. Johnson 2 00
- Third, Warren Fenno 1 00

Josephine of Malines:
- First, Warren Fenno 3 00
- Second, John L. Bird 2 00

Langelier:
- First, Warren Fenno 3 00
- Second, M. W. Chadbourne 2 00

Lawrence:
- First, F. W. Damon 3 00
- Second, A. T. Brown 2 00
- Third, M. W. Chadbourne 1 00

Vicar:
- First, E. S. Converse 3 00
- Second, J. M. Swett 2 00
- Third, A. T. Brown 1 00

Winter Nelis:
- First, A. T. Brown 3 00
- Second, J. Cunning 2 00
- Third, E. A. Hall 1 00

Any other variety:
- First, George V. Fletcher, Bosc 3 00

Second, Warren Fenno, Duchess of Bordeaux	2 00
Third, C. D. Frisbee, Sheldon	1 00
FOREIGN GRAPES.— Any variety:	
First, Mrs. J. C. Whitin, Alicante	5 00
Second, H. Dumaresq	4 00
Third, Daniel Brown	3 00

Gratuities: —

J. G. Masters, Collection of Apples	5 00
L. J. Fosdick, Cranberries	2 00
Rev. Calvin Terry, "	1 00

George McWilliam, New Foreign Grape, Appley Towers, First Class Certificate of Merit.

E. W. WOOD,
CHARLES F. CURTIS,
O. B. HADWEN,
WARREN FENNO,
SAMUEL HARTWELL,
J. WILLARD HILL,
SUMNER COOLIDGE,
} *Committee on Fruits.*

REPORT

OF THE

COMMITTEE ON VEGETABLES,

FOR THE YEAR 1899.

By WARREN HOWARD HEUSTIS, CHAIRMAN.

Notwithstanding an extremely dry season the quality and quantity of the Vegetable exhibits have been fully up to the usual high standard, which proves in a great measure that the intensive gardeners of today are not as great sufferers from the elements as formerly, many of them having very complete water systems. But even with irrigation, the results are not as satisfactory as when crops are watered from the heavens. There have been some new exhibitors and most of the old ones still keep the interest from flagging. At the Saturday exhibitions during the winter the vegetables have been quite plenty and varied; the principal prize winners have been George D. Moore, C. L. Hartshorn, Joshua C. Stone, Hon. Aaron Low, Arthur F. Coolidge, James Comley, and Warren Heustis & Son. The competition has been quite close in most cases.

March 11, A. W. Crockford brought some mushrooms which were considered by many to be the finest specimens ever shown here. At the Spring Exhibition there was a large showing of all kinds, the Lettuce from Wyman Brothers, Mushrooms from A. W. Crockford, Rhubarb from George D. Moore, and Tomatoes from S. J. Goddard, deserving special mention as also the fine collection of fifty-two varieties of Potatoes from Hon. Aaron Low. The first Asparagus was shown by C. L. Hartshorn the 6th of May, and on

the 7th of June, F. Leith, gardener for Francis Blake had the first Peas. The vegetables at the Rose and Strawberry Show were very fine; the principal exhibitors were A. F. Coolidge, C. L. Hartshorn, George D. Moore, and Warren Heustis & Son.

The weekly shows during the year have been very well sustained. The native Mushrooms have been rather meagre, presumably on account of the dry weather.

At the Annual Exhibition the Lower Hall was completely filled with vegetables, which for quality were above the average. The specimens of Potatoes shown were very smooth, and we think the quality has been very good all through the season. The Silver Medal for New Seedling Potatoes was awarded this year for the first time in several years, Hon. Aaron Low being the recipient. The Culinary Herbs made a very interesting and instructive feature of this show. On October 2, A. W. Crockford had a new Cucumber which he has called Crockford's Columbia. It is a cross between Zion House and White Spine. It resembles the White Spine on the outside, but is very solid and has few seeds, and the keeping qualities are very good indeed. The Committee thought very favorably of it and awarded it a First Class Certificate of Merit.

There have been but few changes in the Schedule for the coming year.

The amount appropriated for prizes and gratuities for 1899 was	$1,200
Amount awarded	1,180
Leaving a balance of	$20

out of which a Medal and two Certificates of Merit are to be paid for.

For the Committee,

WARREN H. HEUSTIS,
Chairman.

PRIZES AND GRATUITIES AWARDED FOR VEGETABLES.

1899.

JANUARY 7.

RADISHES.— Four bunches of any variety:

First, Arthur F. Coolidge	$3 00
Second, C. L. Hartshorn	2 00
Third, Joshua C. Stone	1 00

CAULIFLOWERS.— Four heads:

First, Joshua C. Stone	3 00

CELERY.— Four roots:

First, A. F. Coolidge	3 00
Second, C. L. Hartshorn	2 00
Third, Warren Heustis & Son	1 00

LETTUCE.— Four heads:

First, A. F. Coolidge	3 00
Second, George D. Moore	2 00

PARSLEY.— Two quarts:

First, W. N. Craig	2 00
Second, W. N. Craig	1 00

MUSHROOMS.— Twenty-four specimens:

First, E. S. Converse	3 00

TOMATOES.— Twelve specimens:

First, C. A. Learned	3 00
Second, Francis Blake	2 00
Third, William C. Winter	1 00

Gratuities: —

James Comley, Rhubarb	1 00
W. Heustis & Son, Celery	1 00
C. L. Hartshorn, Collection	3 00
Arthur F. Coolidge, "	1 00

JANUARY 14.

Gratuity: —

A. F. Coolidge, Collection	2 00

JANUARY 21.

Gratuity: —

A. F. Coolidge, Collection	1 00

JANUARY 28.

Gratuities: —

George D. Moore, Lettuce	1 00

A. F. Coolidge, Collection 1 00
Warren Heustis & Son, Collection 1 00

FEBRUARY 4.

RADISHES.— Four bunches:
First, A. F. Coolidge 2 00
Second, C. L. Hartshorn 1 00
SALSIFY.— Twelve specimens:
Second, W. Heustis & Son 2 00
Third, C. L. Hartshorn 1 00
CELERY.— Four roots:
First, C. L. Hartshorn 3 00
Second, W. Heustis & Son 2 00
Third, A. F. Coolidge 1 00
LETTUCE.— Four heads:
First, C. L. Hartshorn 3 00
Second, George D. Moore 2 00
Third, A. F. Coolidge 1 00
MUSHROOMS.— Twenty-four specimens:
First, E. O. Orpet 3 00
Second, James Comley 2 00
RHUBARB.— Twelve stalks:
First, James Comley 3 00
Second, E. O. Orpet 2 00
TOMATOES.— Twelve specimens:
First, W. C. Winter, Stone 3 00
Second, W. C. Winter, Chemin 2 00
Third, W. C. Winter, May's Favorite 1 00

Gratuities: —
C. A. Learned, Beets 1 00
W. Heustis & Son, Collection 1 00

FEBRUARY 18.

Gratuities: —
James Comley, Rhubarb 1 00
Norris F. Comley, Radishes 1 00

FEBRUARY 25.

Gratuities: —
A. F. Coolidge, Collection 1 00
N. F. Comley, " 1 00

MARCH 11.

Gratuity: —
A. W. Crockford, Mushrooms 1 00

SPRING EXHIBITION.

MARCH 21, 22, 23 and 24.

William J. Walker Fund.

RADISHES.— Turnip Rooted, four bunches:
- First, A. F. Coolidge 2 00
- Second, C. L. Hartshorn 1 00

Long Scarlet:
- First, H. R. Kinney 2 00

CUCUMBERS.— White Spine, pair:
- First, E. M. Bruce 3 00

SPINACH.—Half-peck:
- First, Hon. Aaron Low 2 00

DANDELIONS.— Peck:
- First, C L. Hartshorn 3 00

LETTUCE.— Four heads:
- First, Wyman Brothers 3 00
- Second, D. L. Tappan 2 00
- Third, C. L. Hartshorn 1 00

WATER CRESS.— Two quarts:
- First, C. L. Hartshorn 2 00
- Second, A. F. Coolidge 1 00

PARSLEY.— Two quarts:
- First, W. N. Craig 2 00
- Second, W. N. Craig 1 00

MUSHROOMS.— Twenty-four specimens:
- First, A. W. Crockford 3 00
- Second, Mrs. B. P. Cheney 2 00
- Third, E. S. Converse 1 00

RHUBARB.— Twelve stalks:
- First, George D. Moore 3 00
- Second, Wyman Brothers 2 00
- Third, George Sanderson 1 00

TOMATOES.— Twelve specimens:
- First, S. J. Goddard 3 00
- Second, Francis Blake 2 00
- Third, William C. Winter 1 00

Gratuities:—

Wyman Brothers, Mushrooms 1 00

Aaron Low, Collection of fifty-two varieties of Potatoes, First Class Certificate of Merit and $5.

C. L. Hartshorn, Collection 2 00

A. F. Coolidge, " 1 00

W. Heustis & Son " 1 00

APRIL 1.

CUCUMBERS.— White Spine, pair:
First, E. M. Bruce $3 00

Gratuities: —
Hon. Aaron Low, Spinach 1 00
A. F. Coolidge, Collection 1 00

APRIL 8.

Gratuities: —
Mrs. E. M. Gill, Tomatoes 1 00
Hon. Aaron Low, Collection 1 00
George D. Moore " 1 00

APRIL 15.

Gratuities: —
Warren Heustis & Son, Lettuce 1 00
Estate of John Jeffries, Parsley 1 00
George D. Moore, Collection 1 00

APRIL 22.

Gratuities: —
Hon. Aaron Low, Spinach 1 00
Mrs. E. M. Gill, Tomatoes 1 00
Mrs. B. P. Cheney, Mushrooms 1 00
George D. Moore, Collection 1 00

APRIL 29.

Gratuities: —
Mrs. E. M. Gill, Tomatoes 1 00
George D. Moore, Collection 1 00
Warren Heustis & Son, Collection 1 00

MAY 6.

William J. Walker, Fund.

ASPARAGUS.— Four bunches:
First, C. L. Hartshorn $3 00
CUCUMBERS.— White Spine, pair:
First, Arthur F. Coolidge 3 00
Second, E. M. Bruce 2 00
Third, Wyman Brothers 1 00
SPINACH.— Peck:
First, Hon. Aaron Low 3 00
Second, C. L. Hartshorn 2 00
Third, Hon. Aaron Low 1 00

DANDELIONS.— Peck:	
First, W. Heustis & Son	2 00
Second, A. F. Coolidge	1 00
LETTUCE.— Four heads:	
First, C. L. Hartshorn	3 00
Second, George D. Moore	2 00
Third, A. F. Coolidge	1 00
RHUBARB.— Twelve stalks:	
First, Warren Heustis & Son	2 00
Second, A. F. Coolidge	1 00
TOMATOES.— Twelve specimens:	
First, Francis Blake, Best of All	3 00
Second, Francis Blake, Essex	2 00
Third, E. M. Bruce, "	1 00

Gratuities: —

George D. Moore, Collection	1 00
A. F. Coolidge, "	1 00
W. Heustis & Son, "	1 00
Hon. Aaron Low, "	1 00
W. N. Craig, "	1 00

MAY 13.

Gratuities: —

Norris F. Comley, Asparagus	1 00
George D. Moore, Collection	2 00
C. L. Hartshorn, "	2 00
W. Heustis & Son, "	2 00

MAY 20.

Gratuities: —

George D. Moore, Collection	1 00
Mrs. E. M. Gill, "	1 00
W. Heustis & Son, "	1 00
C. L. Hartshorn, "	1 00
Norris F. Comley, "	1 00

MAY 27.

Gratuities: —

William H. Hunt, Asparagus	1 00
Mrs. E. M. Gill, Tomatoes	1 00
Hon. Aaron Low, Collection	1 00
George D. Moore, "	1 00
W. Heustis & Son, "	1 00

RHODODENDRON SHOW.

JUNE 7 AND 8.

Theodore Lyman Fund.

BEETS.— Twelve specimens, any variety:

First, H. R. Kinney	3 00
Second, C. L. Hartshorn	2 00
Third, George D. Moore	1 00

CARROTS.— Short Scarlet, twelve specimens:

First, H. R. Kinney,	3 00
Second, C. L. Hartshorn	2 00

RADISHES.— Turnip rooted, four bunches:

First, C. L. Hartshorn	2 00
Second, George D. Moore	1 00

Long Scarlet, four bunches:

First, George D. Moore	2 00
Second, Wyman Brothers	1 00

ASPARAGUS.— Four bunches:

First, William H. Hunt	3 00
Second, Norris F. Comley	2 00
Third, C. L. Hartshorn	1 00

CUCUMBERS.— Pair:

First, George D. Moore	3 00
Second, Wyman Brothers	2 00
Third, H. R. Kinney	1 00

LETTUCE.— Four heads:

First, Estate of Hon. Joseph S. Fay	3 00
Second, Warren Heustis & Son	2 00
Third, George D. Moore	1 00

RHUBARB.— Twelve stalks:

First, Warren Heustis & Son	3 00
Second, Hon. Aaron Low	2 00
Third, Joshua C. Stone	1 00

Gratuities: —

Mrs. E. M. Gill, Tomatoes	1 00
W. C. Winter, "	1 00
Wyman Brothers, Collection	2 00
George D. Moore, "	2 00
C. L. Hartshorn, "	2 00
Francis Blake, "	1 00
W. Heustis & Son, "	1 00

ROSE AND STRAWBERRY SHOW.

JUNE 22 AND 23.

BEETS.— Summer Turnip Rooted, twelve specimens:

First, Arthur F. Coolidge	3 00
Second, C. L. Hartshorn	2 00
Third, Joshua C. Stone	1 00

ONIONS.— Twelve specimens:

First, W. N. Craig	3 00
Second, Wyman Brothers	2 00
Third, George D. Moore	1 00

CUCUMBERS.— White Spine, pair:

First, Arthur F. Coolidge	3 00
Second, George D. Moore	2 00
Third, Warren Heustis & Son	1 00

Any other variety:

First, George D. Moore, Eureka	3 00
Second, George D. Moore, Emerald	2 00

CABBAGES.— Three of any variety, trimmed:

First, Warren Heustis & Son, All Seasons	3 00
Second, Warren Heustis & Son, Early Summer	2 00
Third, George D. Moore, Early Summer	1 00

LETTUCE.— Tennisball, four heads:

First, George D. Moore	3 00
Second, Warren Heustis & Son	2 00
Third, C. L. Hartshorn	1 00

Any other variety:

First, E. C. Lewis, Deacon	3 00
Second, Estate of John Jeffries, Deacon	2 00
Third, George D. Moore, Sensation	1 00

PEAS.— Any variety, half-peck:

First, H. R. Kinney	3 00
Second, George D. Moore	2 00
Third, C. L. Hartshorn	1 00

Gratuities: —

E. C. Lewis, Collection	1 00
Hon. Aaron Low, "	1 00
Estate of John Jeffries, Collection	1 00
Warren Heustis & Son, "	1 00
William C. Winter, "	1 00
George D. Moore, "	1 00
Sumner Coolidge, "	1 00
C. L. Hartshorn, "	1 00

JULY 1.

POTATOES.— Twelve specimens:

First, George D. Moore, Early Bovee	3 00
Second, E. C. Lewis, Bliss's Triumph	2 00
Third, C. L. Hartshorn, Early Fortune	1 00

ONIONS.— Twelve specimens:

First, Wyman Brothers	2 00
Second, George D. Moore	1 00

SQUASHES.— Long Warted, four:

First, Joshua C. Stone	3 00
Second, Sumner Coolidge	2 00
Third, C. L. Hartshorn	1 00

Scalloped:

First, Joshua C. Stone	2 00
Second, Sumner Coolidge	1 00

CABBAGES.— Three of any variety, trimmed:

First, Warren Heustis & Son, Succession	3 00
Second, George D. Moore, "	2 00
Third, Warren Heustis & Son, No. 2	1 00

BEANS.— Half-peck of Golden Wax:

First, Sumner Coolidge	3 00
Second, Joshua C. Stone	2 00
Third, I. E. Coburn	1 00

Half-peck of any other variety:

First, George D. Moore, Davis	3 00
Second, I. E. Coburn, Cranberry	2 00
Third, Arthur F. Coolidge, Mohawk	1 00

PEAS.— American Wonder, half-peck:

First, E. C. Lewis	3 00
Second, C. L. Hartshorn	2 00

Advancer:

First, C. L. Hartshorn	3 00
Second, George B. Gill	2 00

Any other variety:

First, C. L. Hartshorn, Telephone	3 00
Second, E. C. Lewis, Prosperity	2 00
Third, W. Warburton, Carter's Daisy	1 00

Gratuity: —

W. Warburton, Collection	1 00

JULY 8.

CABBAGES.— Three Drumhead, trimmed:

First, Warren Heustis & Son	3 00
Second, George D. Moore	2 00

BEANS.— Half-peck of Cranberry:	
First, I. E. Coburn	3 00
Second, Joshua C. Stone	2 00
SWEET CORN.— Twelve ears:	
First, Sumner Coolidge, Cory	3 00
Second, Joshua C. Stone, "	2 00
TOMATOES.— Open culture:	
First, Sumner Coolidge, Atlantic	3 00
Second, Arthur F. Coolidge, "	2 00
Third, W. N. Craig, Essex	1 00
Gratuities: —	
Estate of Hon. Joseph S. Fay, Potatoes	1 00
George D. Moore, Collection	1 00
W. Heustis & Son, "	1 00
W. Warburton, "	1 00
E. C. Lewis, "	1 00
Arthur F. Coolidge "	1 00
C. L. Hartshorn, "	1 00

JULY 15.

POTATOES.— Twelve specimens of any variety:	
First, J. Burns, Early Northern	3 00
Second, Hon. Aaron Low, Early Fortune	2 00
Third, Estate of Hon. J. S. Fay, Hebron	1 00
LETTUCE.— Tennisball, four heads:	
First, Sumner Coolidge	2 00
Second, C. L. Hartshorn	1 00
Any other variety:	
First, C. L. Hartshorn	2 00
Second, Warren Heustis & Son	1 00
PEAS.— Stratagem, half-peck:	
First, C. L. Hartshorn	3 00
Second, Hon. Aaron Low	2 00
Any other variety:	
First, C. L. Hartshorn, Telephone	3 00
Second, Hon. Aaron Low "	2 00
SWEET CORN.— Twelve ears of any variety:	
First, Sumner Coolidge, Crosby	3 00
Second, Sumner Coolidge, Hybrid	2 00
Third, Joshua C. Stone, Cory	1 00
TOMATOES.— Twelve specimens:	
First, Sumner Coolidge	3 00
Second, Joshua C. Stone	2 00
Third, Arthur F. Coolidge	1 00

JULY 22.

POTATOES.— Any variety, twelve specimens:

First, J. W. Burns	3 00
Second, F. J. Kinney	2 00
Third, Hon. Aaron Low	1 00

SQUASHES.— Three Marrow:

First, Warren Heustis & Son	3 00

SWEET CORN.— Twelve ears, Crosby:

First, Hittinger Brothers	3 00
Second, Sumner Coolidge	2 00

Any other variety:

First, Joshua C. Stone, Quincy Market	3 00

TOMATOES.— Twelve specimens:

First, Hittinger Brothers, Stone	3 00
Second, Sumner Coolidge, "	2 00
Third, Joshua C. Stone, "	1 00

MUSHROOMS.— Not less than five edible varieties:

Second, Miss Alice L. Grinnell	3 00

Gratuities: —

C. A. Berg, Kohl Rabi	1 00
W. N. Craig, Cucumbers	1 00

JULY 29.

BEANS.— Goddard, two quarts:

First, Warren Heustis & Son	3 00
Second, I. E. Coburn	2 00
Third, David L. Fiske	1 00

Horticultural:

First, David L. Fiske	3 00
Second, C. L. Hartshorn	2 00
Third, Sumner Coolidge	1 00

TOMATOES.— Comrade, twelve specimens:

First, Arthur F. Coolidge	3 00
Second, I. E. Coburn	2 00
Third, Hon. Aaron Low	1 00

Stone:

First, Francis Blake	3 00
Second, Hittinger Brothers	2 00
Third, E. N. Pierce	1 00

Any other variety:

First, Hittinger Brothers, Hybrid	3 00
Second, Warren Heustis & Son, Hybrid	2 00
Third, Sumner Coolidge, Atlantic	1 00

EGG PLANTS.— Round Purple, four:

First, Arthur F. Coolidge	3 00

Second, Joshua C. Stone	2 00
Third, Sumner Coolidge	1 00
Gratuities: —	
Hon. Aaron Low, Potatoes	1 00
J. W. Burns, "	1 00
Joshua C. Stone, Melons	1 00
Warren Heustis & Son, Collection	1 00
E. C. Lewis, "	1 00

AUGUST. 5.

GREEN FLESH MELONS.— Four specimens:	
First, Arthur F. Coolidge	3 00
Second, C. L. Hartshorn	2 00
Third, Joshua C. Stone	1 00
SALMON FLESH MELONS.— Four specimens:	
First, C. L. Hartshorn	3 00
Third, Joshua C. Stone	1 00
SWEET CORN.— Twelve ears:	
First, I. E. Coburn, Potter's Excelsior	3 00
Second, Oliver R. Robbins, Kendall's Giant	2 00
Third, Sumner Coolidge, Potter's Excelsior	1 00
EGG PLANTS.— Round Purple, four:	
First, Arthur F. Coolidge	3 00
Second, Sumner Coolidge	2 00
Third, Norris F. Comley	1 00
Gratuities: —	
George F. Stone, Collection	1 00
Hon. Aaron Low, "	1 00

AUGUST 12.

POTATOES.— Twelve specimens of any variety:	
First, E. C. Lewis, Thoroughbred	3 00
Second, J. W. Burns, Early Northern	2 00
Third, Hon. Aaron Low, Early Fortune	1 00
ONIONS.— Twelve specimens:	
First, E. C. Lewis, Prize Taker	3 00
Second, Sumner Coolidge, Danvers	2 00
Third, W. N. Craig, Danvers	1 00
GREEN FLESH MELONS.— Four specimens:	
First, Arthur F. Coolidge	3 00
Second, C. L. Hartshorn	2 00
Third, Joshua C. Stone	1 00

SALMON FLESH MELONS.— Any variety, four specimens:

First, Varnum Frost	3 00
Second, George D. Moore	2 00
Third, Joshua C. Stone	1 00

CELERY.— Four roots of any variety:

First, Arthur F. Coolidge	3 00
Second, W. N. Craig	2 00
Third, Warren Heustis & Son	1 00

BEANS.— Small Lima, two quarts:

First, Sumner Coolidge	3 00

Goddard:

First, Warren Heustis & Son	3 00
Second, C. L. Hartshorn,	2 00
Third, Hon. Aaron Low	1 00

SWEET CORN.— Potter's Excelsior, twelve ears:

First, I. E. Coburn	3 00
Second, E. C. Lewis	2 00
Third, Oliver R. Robbins	1 00

Any other variety:

First, E. C. Lewis, Crosby	3 00
Second, Joshua C. Stone, Bear's Foot	2 00
Third, Joshua C. Stone, Crosby	1 00

PEPPERS.— Squash, twelve specimens:

First, Arthur F. Coolidge	3 00
Second, George Lincoln	2 00
Third, Hon. Aaron Low	1 00

Any other variety:

First, E. C. Lewis, Ruby King	3 00
Second, Joseph Thorp, "	2 00
Third, C. L. Hartshorn, "	1 00

Gratuities: —

Mrs. E. M. Gill, Tomatoes	1 00
E. C. Lewis, Collection	2 00
W. H. Burlen, "	1 00
C. A. Berg, "	1 00
W. Heustis & Son, "	1 00

AUGUST 19.

GREEN FLESH MELONS.— Four specimens:

First, C. L. Hartshorn	3 00
Second, Joshua C. Stone	2 00
Third, Arthur F. Coolidge	1 00

SALMON FLESH MELONS.— Four specimens:

First, George D. Moore	3 00
Second, Varnum Frost	2 00

WATERMELONS.— Pair:

First, C. L. Hartshorn	3 00

CABBAGES.— Three of any variety, trimmed:
First, C. L. Hartshorn 3 00
CAULIFLOWERS.— Four specimens:
First, W. S. Luscomb 3 00
Second, B. J. De Souza 2 00
CELERY.— Four roots:
First, Arthur F. Coolidge 3 00
Second, W. N. Craig 2 00
Third, Warren Heustis & Son, ... 1 00
BEANS.— Large Lima, two quarts
First, C. L. Hartshorn 3 00
Second, Sumner Coolidge 2 00
Small Lima:
First, Oliver R. Robbins 3 00
Second, C. L. Hartshorn 2 00
MARTYNIAS.— Twelve specimens:
First, E. S. Converse 2 00
Second, E. C. Lewis 1 00

Gratuities: —
E. C. Lewis, Collection 2 00
W. N. Craig, " 2 00
W. Heustis & Son, " 1 00
Hon. Aaron Low, " 1 00

AUGUST 30.

Gratuity: —
James Comley, Collection of Celery 2 00
James Comley, New London Celery, First Class Certificate of Merit

SEPTEMBER 2.

Gratuity: —
Warren Heustis & Son, Celery 1 00

SEPTEMBER 9.

TURNIPS.— Flat, twelve:
First, E. C. Lewis 3 00
Second, C. L. Hartshorn 2 00
GREEN FLESH MELONS.— Four specimens:
First, C. L. Hartshorn 3 00
Second, Joshua C. Stone 2 00
Third, I. E. Coburn 1 00
SALMON FLESH MELONS.— Four specimens:
First, George D. Moore 3 00
Second, Joshua C. Stone 2 00

WATERMELONS.— Two specimens:

First E. C. Lewis	3 00
Second, C. L. Hartshorn	2 00
Third, Rev. C. Terry	1 00

CAULIFLOWERS.— Four specimens:

First, B. J. De Souza	3 00
Second, William H. Teele	2 00
Third, C. M. Handley	1 00

LETTUCE. — Four heads of any variety:

First, George D. Moore, Deacon	3 00
Second, Sumner Coolidge, Tennisball	2 00
Third, George F. Stone, "	1 00

CELERY. — Four roots of any variety:

First, Arthur F. Coolidge	3 00
Second, Warren Heustis & Son	2 00
Third, C. L. Hartshorn	1 00

PARSLEY. — Two quarts:

First, W. N. Craig	2 00
Second, C. L. Hartshorn	1 00

BEANS. — Large Lima, two quarts:

First, Mrs. E. M. Gill	3 00
Second, C. M. Handley	2 00
Third, Sumner Coolidge	1 00

Small Lima:

First, E. C. Lewis	3 00
Second, Sumner Coolidge	2 00
Third, C. L. Hartshorn	1 00

CORN. — Potter's Excelsior, twelve ears:

First, I. E. Coburn	3 00
Second, E. C. Lewis	2 00
Third, Arthur F. Coolidge	1 00

Any other sweet variety:

First, E. C. Lewis	3 00
Second, C. L. Hartshorn	2 00
Third, Hon. Aaron Low	1 00

EGG PLANTS.— Round Purple, four:

First, Arthur F. Coolidge	3 00
Second, Sumner Coolidge	2 00
Third, Norris F. Comley	1 00

TOMATOES.— Three varieties, twelve specimens each:

First, Hon. Aaron Low	5 00
Second, Varnum Frost	4 00
Third, Arthur F. Coolidge	3 00

Aristocrat, twelve:

First, Joseph Thorp	3 00
Second, Hon. Aaron Low	2 00
Third, Varnum Frost	1 00

Comrade:
First, Hon. Aaron Low 3 00
Second, Arthur F. Coolidge 2 00
Third, Joshua C. Stone 1 00
May's Favorite:
First, Hon. Aaron Low 3 00
Second, Varnum Frost 2 00
Third, W. N. Craig 1 00
Any other variety:
First, Joseph Thorp, Stone 3 00
Second, Hittinger Brothers, Stone 2 00
Third, Varnum Frost, " 1 00
MARTYNIAS.— Twelve specimens:
First, Sumner Coolidge, ... 2 00
Second, E. C. Lewis 1 00
OKRA.— Twelve specimens:
First, E. C. Lewis 2 00
Second, E. C. Lewis 1 00
PEPPERS.— Squash, twelve specimens:
First, George Lincoln 2 00
Second, E. C. Lewis 1 00
Any other variety:
First, C. L. Hartshorn, Ruby King 2 00
Second, E. C. Lewis, " " 1 00

Gratuities: —
Warren Heustis & Son, Collection 2 00
E. C. Lewis, " 2 00
Hon. Aaron Low, " 2 00
W. N. Craig, " 1 00

SEPTEMBER 16.

Gratuities: —
Mrs. G. Duncan, Collection 1 00
Warren Heustis & Son, " 1 00

ANNUAL EXHIBITION OF FRUITS AND VEGETABLES.

SEPTEMBER 28 AND 29.

Special Prizes.

POTATOES.— New Seedlings, best collection:
Hon. Aaron Low, Silver Medal.

Regular Prizes.

BEETS.— Turnip Rooted, twelve:
First, E. C. Lewis 3 00

Second, Joshua C. Stone	2 00
Third, W. Warburton	1 00
CARROTS.— Long Orange, twelve:	
First, E. C. Lewis	3 00
Second, W. Warburton	2 00
Third, C. L. Hartshorn	1 00
Intermediate, twelve:	
First, W. Warburton	3 00
Second, E. C. Lewis	2 00
Third, W. A. Donnell	1 00
PARSNIPS.— Long, twelve:	
First, Warren Heustis & Son	3 00
Second, George D. Moore	2 00
Third, E. C. Lewis	1 00
POTATOES.— Four varieties, twelve specimens each:	
First, C. H. Thomas	5 00
Second, F. J. Kinney	4 00
Third, H. R. Kinney	3 00
Carman No. 1:	
First, C. H. Thomas	3 00
Second, Hon. Aaron Low	2 00
Clark:	
First, C. H. Thomas	3 00
Second, Hon. Aaron Low	2 00
Third, F. J. Kinney	1 00
Hebron:	
First, H. R. Kinney	3 00
Second, F. J. Kinney	2 00
Third, C. H. Thomas	1 00
Rose:	
First, C. H. Thomas	3 00
Second, F. J. Kinney	2 00
Third, H. E. Rich	1 00
Any other variety:	
First, F. J. Kinney, Early Bovee	3 00
Second, E. C. Lewis, Somerset	2 00
Third, C. H. Thomas, Sir Walter Raleigh	1 00
SALSIFY.—Twelve specimens:	
First, Warren Heustis & Son	3 00
Second, D. L. Tappan	2 00
Third, W. Warburton	1 00
TURNIPS.— Flat, twelve:	
First, Wilfred Wheeler	3 00
Second, George F. Wheeler	2 00
Third, F. J. Kinney	1 00

Swedish:	
First, E. C. Lewis	3 00
Second, E. C. Lewis	2 00
Third, C. L. Hartshorn	1 00
ONIONS.— Danvers, twelve:	
First, B. P. Winch	3 00
Second, W. N. Craig	2 00
Third, C. L. Hartshorn	1 00
Red:	
First, W. N. Craig	3 00
Second, C. L. Hartshorn	2 00
Third, E. C. Lewis	1 00
White:	
First, C. L. Hartshorn	2 00
Second, Sumner Coolidge	1 00
Any other variety:	
First, E. C. Lewis, Prize Taker	3 00
Second, W. N. Craig, "	2 00
Third, C. L. Hartshorn "	1 00
SQUASHES.— Bay State, three:	
First, Joshua C. Stone	3 00
Second, C. L. Hartshorn	2 00
Third, E. C. Lewis	1 00
Hubbard:	
First, C. L. Hartshorn	3 00
Second, Joshua C. Stone	2 00
Third, Arthur F. Coolidge	1 00
Hybrid Turban:	
First, E. C. Lewis	3 00
Second, C. L. Hartshorn	2 00
Third, George N. Lincoln	1 00
Marblehead:	
First, E. C. Lewis	3 00
Second, C. L. Hartshorn	2 00
Marrow:	
First, E. C. Lewis	3 00
Second, Arthur F. Coolidge	2 00
Third, Hon. Aaron Low	1 00
Any other variety:	
First, C. L. Hartshorn	3 00
Second, Hon. Aaron Low	2 00
Third, Warren Heustis & Son	1 00
CUCUMBERS.— White Spine, pair:	
First, W. N. Craig	3 00
Second, Joshua C. Stone	2 00

Any other variety:
First, W. N. Craig 3 00
Second, Hon. Aaron Low 2 00

GREEN FLESH OR SALMON FLESH MELONS.— Four specimens:
First, C. L. Hartshorn 3 00
Second, George D. Moore 2 00
Third, C. L. Hartshorn 1 00

WATERMELONS.— Two specimens:
First, E. C. Lewis 3 00
Second, Hon. Aaron Low 2 00
Third, C. L. Hartshorn 1 00

BRUSSELS SPROUTS.— Half-peck:
First, C. L. Hartshorn 3 00
Second, E. C. Lewis 2 00
Third, E. S. Converse 1 00

CABBAGES.— Drumhead, three, trimmed:
First, Samuel Hartwell 3 00
Second, E. C. Lewis 2 00
Third, C. L. Hartshorn 1 00

Red:
First, Samuel Hartwell 3 00
Second, E. C. Lewis 2 00
Third, B. P. Winch 1 00

Savoy:
First, B. P. Winch 3 00
Second, E. C. Lewis 2 00
Third, C. L. Hartshorn 1 00

CAULIFLOWERS.— Four specimens:
First, C. M Handley 5 00
Second, De Souza Brothers 4 00
Third, William H. Teele 3 00

CELERY.— Paris Golden, four roots, best kept during the exhibition:
First, Arthur F. Coolidge 5 00
Second, Warren Heustis & Son 4 00
Third, C. L. Hartshorn 3 00

Any other variety:
First, Warren Heustis & Son, Pascal 5 00
Second, A. Nixon, White Plume 4 00
Third, W. N. Craig, " 3 00

ENDIVE.— Four specimens:
First, C. L. Hartshorn 3 00
Second, E. C. Lewis 2 00
Third, E. C. Lewis 1 00

LETTUCE.— Four heads:
First, George D. Moore 3 00
Second, Warren Heustis & Son 2 00

Third, C. L. Hartshorn	1 00
PARSLEY.— Two quarts:	
First, W. N. Craig	2 00
Second, C. L. Hartshorn	1 00
HORSERADISH.— Six roots, present year's growth:	
First, H. R. Kinney	2 00
Second, W. Warburton	1 00
CORN.— Yellow or Field, twenty-five ears, traced:	
First, Elliott Moore	3 00
Second, H. E. Rich	2 00
Third, H. E. Rich	1 00
Sweet, twelve ears:	
First, C. L. Hartshorn	3 00
Second, E. C. Lewis	2 00
Third, E. C. Lewis	1 00
EGG PLANTS.— Round Purple, four:	
First, Arthur F. Coolidge	3 00
Second, C. L. Hartshorn	2 00
Third, Sumner Coolidge	1 00
TOMATOES.— Three varieties, twelve specimens each:	
First, Varnum Frost	4 00
Second, Arthur F. Coolidge	3 00
Third, W N. Craig	2 00
Aristocrat:	
First, Joseph Thorp	3 00
Second, E. M. Bruce	2 00
Third, Varnum Frost	1 00
May's Favorite:	
First, Warren Heustis & Son	3 00
Second, B. P. Winch	2 00
Third, W. N. Craig	1 00
Stone:	
First, Hon. Aaron Low	3 00
Second, Varnum Frost	2 00
Third, B. P. Winch	1 00
Any other variety:	
First, Joseph Thorp, Combination	3 00
Second, W. Warburton, Matchless	2 00
Third, Arthur F. Coolidge, Perfection	1 00
PEPPERS.— Squash, twelve specimens:	
First, George W. Jameson	3 00
Second, Hon. Aaron Low	2 00
Any other variety:	
First, C. L. Hartshorn	3 00
Second, Joseph Thorp	2 00
Third, A. Nixon	1 00

CULINARY HERBS, GREEN.— Collection, named:

First, W. N. Craig	5 00
Second, C. L. Hartshorn	4 00
Third, W. Warburton	3 00

Gratuities: —

C. L. Hartshorn, Collection	5 00
W. N. Craig, "	5 00
W. Heustis & Son, "	5 00
E. C. Lewis, "	3 00
George D. Moore, "	2 00
W. Warburton, "	2 00
Hon. Aaron Low, "	2 00
George F. Stone, "	1 00
B. P. Winch, "	1 00

OCTOBER 21.

Gratuities: —

Warren Heustis & Son, Celery	1 00
Hon. Aaron Low, Turnips	1 00

A. W. Crawford, New Cucumber, Crockford's Columbia, First Class Certificate of Merit.

OCTOBER 28.

Gratuity: —

Warren Heustis & Son, Salsify	1 00

NOVEMBER 4.

Gratuities: —

George D. Moore, Lettuce	1 00
Warren Heustis & Son, Celery	1 00

EXHIBITION OF WINTER FRUITS AND VEGETABLES.

NOVEMBER 18.

PARSNIPS.— Twelve specimens:

First, Warren Heustis & Son	3 00
Second, George D. Moore	2 00
Third, D. L. Tappan	1 00

CUCUMBERS. — Pair:

First, Joshua C. Stone	3 00
Second, C. A. Learned	2 00
Third, Mrs. John L. Gardner	1 00

CABBAGES.— Red, three:

First, C. L. Hartshorn	3 00

Savoy:

First, Joshua C. Stone	3 00
Second, C. L. Hartshorn	2 00

BRUSSELS SPROUTS. — Half peck:

First, H. Dumaresq	3 00
Second, Mrs. John L. Gardner	2 00
Third, C. L. Hartshorn	1 00

CAULIFLOWERS.— Four specimens:

First, C. M. Handley	3 00

CELERY.— Four roots:

First, Warren Heustis & Son	3 00
Second, D. L. Tappan	2 00
Third, C. L. Hartshorn	1 00

LETTUCE.— Four heads:

First, George D. Moore	3 00

TOMATOES.— Twelve specimens, grown under glass:

First, William C. Winter	3 00
Second, Francis Blake	2 00
Third, C. A. Learned	1 00

Gratuities: —

C. M. Handley, Cauliflowers	1 00
D. L. Tappan, Salsify	1 00
Hon. James J. H. Gregory, No. 7 Squash	1 00
C. L. Hartshorn, Collection	4 00
W. Heustis & Son, "	4 00
George D. Moore, "	2 00
Hon. Aaron Low, "	1 00

NOVEMBER 25.

Gratuities: —

Joshua C. Stone, Cucumbers	1 00
Warren Heustis & Son, Collection	2 00

DECEMBER 2.

Gratuity: —

Warren Heustis & Son, Collection	1 00

DECEMBER 16.

Gratuity: —

Charles A. Learned, Tomatoes, First Class Certificate of Merit and $1.

WARREN HOWARD HEUSTIS,
CEPHAS H. BRACKETT,
VARNUM FROST,
WALTER RUSSELL,
AARON LOW,
GEORGE D. MOORE,
JOSHUA C. STONE,

Committee on Vegetables.

REPORT

OF THE

COMMITTEE ON GARDENS,

FOR THE YEAR 1899.

By PATRICK NORTON, CHAIRMAN.

The season which is about closing has been one of great activity with your Committee. We have been called upon to visit seventeen places, all of which have been examined with pleasure both to the Committee and to the proprietors. In nearly every instance the weather has been favorable, and the excursions, thus made pleasant, have been very enjoyable. We will take the notices in their order and describe each place in as brief a manner as possible, and at the end of this report will be found a list of the prizes and gratuities awarded by your Committee.

F. A. BLAKE'S CARNATION HOUSE, ROCHDALE.

The first visit was on the 18th of April, to the estate of F. A. Blake, at Rochdale, to view a house of carnations which was filled with plants of a seedling, of a rich scarlet color, originated by Mr. Blake and named Bon Ton. The house was in fine condition, and the plants were robust and healthy and profusely flowered. The flower stems were fully eighteen inches long, upright in habit, and of strong growth. The flowers are of medium size, and command a ready sale in the market.

WILLIAM NICHOLSON'S TOMATO HOUSE, FRAMINGHAM.

The second visit was on May 11th to William Nicholson, Framingham, to inspect a house of tomatoes, principally grown on benches. The house, one hundred feet long by fifteen feet wide,

contained two hundred and fifty plants on the main bench, planted in four rows the length of the house, and about two feet apart in the rows, all planted January 1st. A careful estimate by the Committee was made, and it was agreed that the house then contained fully two tons of fruit. Everything about the houses was clean, neat, and thrifty, the whole plant presenting a prosperous appearance.

E. M. Bruce's Cucumber House, Leominster.

The third visit was to the farm of E. M. Bruce, Leominster, on May 17th, to inspect a house of cucumbers. The house was one hundred and fifty feet long by twenty feet wide, and was planted in four rows lengthwise and two feet apart in the rows. The vines were in full bearing when we saw them, and presented a very healthy and vigorous appearance although Mr. Bruce reported to us that he had already cut ten thousand cucumbers up to that time, in four months.

Mrs. David Nevins's Estate, Methuen.

The fourth visit occurred on June 9th, by the kind invitation of Mrs. David Nevins, of Methuen (formerly of South Framingham). This estate has been in the family a great many years and consists of from forty to fifty acres of land planted with a large variety of trees and shrubs, some of which are fine specimens of arboreal growth. The buildings correspond with the surroundings and are of that old-fashioned and comfortable style, which appeals to one's sense of comfort and hospitality, always to be found in those peaceful homes occupied by the descendants of old-fashioned people. Our visit to Mrs. Nevins was one of the most delightful in our recollection.

In this vicinity is Memorial Hall, which was presented to the town by the late David Nevins, and is a magnificent monument of his generosity. It contains a fine large library, a reading room and a beautiful memorial window which must have cost a great sum of money. Contiguous to the hall has been erected an appropriate monument over the grave of the late Mr. Nevins. It is a splendid work of art and will perpetuate the memory of a good man after this generation shall have passed away.

SALMON FLESH MELONS.— Any variety, four specimens:

First, Varnum Frost	3 00
Second, George D. Moore	2 00
Third, Joshua C. Stone	1 00

CELERY.— Four roots of any variety:

First, Arthur F. Coolidge	3 00
Second, W. N. Craig	2 00
Third, Warren Heustis & Son	1 00

BEANS.— Small Lima, two quarts:

First, Sumner Coolidge	3 00

Goddard:

First, Warren Heustis & Son	3 00
Second, C. L. Hartshorn,	2 00
Third, Hon. Aaron Low	1 00

SWEET CORN.— Potter's Excelsior, twelve ears:

First, I. E. Coburn	3 00
Second, E. C. Lewis	2 00
Third, Oliver R. Robbins	1 00

Any other variety:

First, E. C. Lewis, Crosby	3 00
Second, Joshua C. Stone, Bear's Foot	2 00
Third, Joshua C. Stone, Crosby	1 00

PEPPERS.— Squash, twelve specimens:

First, Arthur F. Coolidge	3 00
Second, George Lincoln	2 00
Third, Hon. Aaron Low	1 00

Any other variety:

First, E. C. Lewis, Ruby King	3 00
Second, Joseph Thorp, "	2 00
Third, C. L. Hartshorn, "	1 00

Gratuities: —

Mrs. E. M. Gill, Tomatoes	1 00
E. C. Lewis, Collection	2 00
W. H. Burlen, "	1 00
C. A. Berg, "	1 00
W. Heustis & Son, "	1 00

AUGUST 19.

GREEN FLESH MELONS.— Four specimens:

First, C. L. Hartshorn	3 00
Second, Joshua C. Stone	2 00
Third, Arthur F. Coolidge	1 00

SALMON FLESH MELONS.— Four specimens:

First, George D. Moore	3 00
Second, Varnum Frost	2 00

WATERMELONS.— Pair:

First, C. L. Hartshorn	3 00

CABBAGES.— Three of any variety, trimmed:
First, C. L. Hartshorn 3 00
CAULIFLOWERS.— Four specimens:
First, W. S. Luscomb 3 00
Second, B. J. De Souza 2 00
CELERY.— Four roots:
First, Arthur F. Coolidge 3 00
Second, W. N. Craig 2 00
Third, Warren Heustis & Son, ... 1 00
BEANS.— Large Lima, two quarts
First, C. L. Hartshorn 3 00
Second, Sumner Coolidge 2 00
Small Lima:
First, Oliver R. Robbins 3 00
Second, C. L. Hartshorn 2 00
MARTYNIAS.— Twelve specimens:
First, E. S. Converse 2 00
Second, E. C. Lewis 1 00

Gratuities: —
E. C. Lewis, Collection 2 00
W. N. Craig, " 2 00
W. Heustis & Son, " 1 00
Hon. Aaron Low, " 1 00

AUGUST 30.

Gratuity: —
James Comley, Collection of Celery 2 00
James Comley, New London Celery, First Class Certificate of Merit

SEPTEMBER 2.

Gratuity: —
Warren Heustis & Son, Celery 1 00

SEPTEMBER 9.

TURNIPS.— Flat, twelve:
First, E. C. Lewis 3 00
Second, C. L. Hartshorn 2 00
GREEN FLESH MELONS.— Four specimens:
First, C. L. Hartshorn 3 00
Second, Joshua C. Stone 2 00
Third, I. E. Coburn 1 00
SALMON FLESH MELONS.— Four specimens:
First, George D. Moore 3 00
Second, Joshua C. Stone 2 00

RESIDENCE OF ARTHUR F. ESTABROOK, BEACH BLUFF.

ever saw; and this decision was confirmed by several of the best farmers of Arlington, who had been invited to go with the Committee. The vegetable garden showed good cultivation and a thrifty appearance, notwithstanding a very dry springtime. There was not a very great variety of vegetables, but the tomatoes, beans, and peas were remarkably fine.

Sumner and Frank E. Coolidge's Vegetable Farm, Mount Auburn.

The eighth visit occurred on July 6th, and was to the vegetable farm of Sumner and Frank E. Coolidge, at Mount Auburn. This farm has the advantage of an abundant water supply, which is so well distributed all over the farm that the growing crops never get thirsty from the want of water. The past summer was a very trying one to farmers who had no adequate supply of water, but on this farm the vegetables looked as thrifty as though it rained every other day. The weather of late years is so variable that it would seem to be economy for all our early and late vegetable farmers to put in adequate irrigating plants to protect their farms from such a drought as we have had during the past summer.

Arthur F. Estabrook's Grounds, Beach Bluff.

The next visit was to the summer estate of Arthur F. Estabrook, at Beach Bluff. The estate is entered for the Hunnewell Triennial Premium, and this is the third year of inspection. The whole of the place was in splendid condition notwithstanding it was a very dry summer and trying to lawns, shrubs, and flower gardens, the flower beds, the lawn, and the shrubs and trees showed that none of them had suffered by the effects of drought. The whole place showed increased care by Mr. Barker, the gardener, and a greater degree of taste in the arrangement of flower-bed effects than formerly. The estate is beautifully situated and enjoys a splendid outlook over the ocean, making it a delightful summer home for the owner. The Committee has awarded the estate the first of the Hunnewell Triennial Premiums.

The Oliver Ames Estate, North Easton.

On August 29th we visited the Oliver Ames estate at North Easton, occupied by Oakes Ames. This estate is entered in competition for the Hunnewell Triennial Premium and this is the first

year of entry. The place is furnished with very fine stone buildings, which were erected by his father, the late governor of this state, and has the advantage of a beautiful pond which borders it on the south, with other ponds, devoted to the culture of all kinds of aquatics, in the grounds. The surface of the place is nicely undulating and is covered with various superb forest trees, all of which were planted by the late governor as to his good judgment seemed best. The trees are so far apart that each has had room enough to develop and become a fine specimen of its kind. Mr. Ames is devoting a portion of his valuable time to the improvement of our native wild flowers by hybridizing and careful cultivation. His stove and greenhouses are remarkable, for they contain a very large collection of orchids and other plants from all over the world. The whole estate was in good condition, except that the drought had partially spoiled the grass among the forest trees.

George Abbot James's Estate, Nahant.

The eleventh visit was made on September 11th, to the estate of George Abbot James, at Nahant. This was our first visit to this estate, which is entered for the Hunnewell Triennial Premium. It consists of twenty-five acres of land and rocks, and is situated at the extreme south end of this rock-bound promontory. About thirty years ago this place was a wind-swept sand dune, but now it presents to the eye a very different appearance. A walk has been constructed on the cliffs, which affords some of the grandest views to be found on this rugged coast, and when the sea is angry the water roars over the immense boulders which line the shore, in a terrific manner. The sand has been hidden by a thick coating of loam; trees, shrubs, and flower-beds have been planted and the whole place has been made to "blossom like the rose." The place has an advantage over inland estates inasmuch as the huge rocks and the never quiet sea are ever present, making this promontory a most delightful summer home.

Col. Frederick Mason's Vegetable Garden, Taunton.

We visited the estate of Col. Frederick Mason, at Taunton, on the 14th of September, to inspect his vegetable garden, which consists of about five acres and was planted with almost every

vegetable we read about in the lists yearly issued by our best seedsmen. Mr. E. C. Lewis is the gardener, and the grand appearance of the crop would indicate that good care is constantly applied, leading to successful results. Mr. Lewis is to be congratulated, as also is Colonel Mason, for it is seldom one sees a vegetable garden with such a variety of good food for the table.

Col. Charles Pfaff's Estate, South Framingham.

The fourteenth visit was to the beautiful estate of Col. Charles Pfaff, at South Framingham, to view a house of chrysanthemums planted on benches. We saw over six hundred plants flowered to one stem. There were over thirty varieties. The flowers were very large and well finished; the foliage was excellent. Some few flowers showed the effect of a week's warm weather, but otherwise the growth and flowering reflected great credit on the gardener, George Melvin.

Mrs. B. P. Cheney's Chrysanthemum Houses, Wellesley.

The next visit was on the 3rd of November to Mrs. B. P. Cheney, at Wellesley, to inspect chrysanthemums in pots and on benches. The house of chrysanthemums in pots, arranged for effect with foliage plants interspersed, gave the house a sumptuous appearance, and was by far the best house of this gorgeous flower we have ever seen. The fine hand of John Barr was shown in the arrangement, and he deserves great credit for growing such grand plants for exhibition. We append the names of all the plants in this house, and will say that each one was very symmetrical in form, magnificently flowered, and would average over six feet in diameter:

Arethusa,
Autumn Glory,
Charity,
Charles Molin,
C. H. Curtis,
Defender,
Frank Hardy,
Georgiana Pitcher,
Georgienne Bramhall,
Golden Gate,
Golden Trophy,
Iora,
Ivory,
John Shrimpton,
Lady Hanham,
Louis Boehmer,
Marion Henderson,
Mrs. E. B. Freeman,

Mrs. F. A. Constable,	Phenomenon,
Mrs. J. G. Breer,	Pink Ivory,
Mrs. H. Weeks,	Red Warrior,
Mutual Friend,	Savannah,
Onyx,	Silver Cloud,
Peter Kay,	The Bard.

The plants on benches were grown to one bloom each. They were fine stalwart plants and in the very best condition.

Edward Hatch's Estate, Wenham.

The sixteenth visit was to "The Windmill" on Lake Wenham. This estate, which has but lately come into the possession of Edward Hatch, is situated on the shore of Lake Wenham on an elevation which commands a superb outlook "over the lake and far away." It is an ideal summer home, and one which is being improved by the planting of trees and shrubs. It will be the study of the proprietor, assisted by his numerous friends, to produce an artistic and beautiful place where restful pleasure may reign supreme, and the joys of living may be appreciated by his own good self and his hosts of friends.

Edmund M. Wood & Co.'s Waban Conservatories, Natick.

The last visit of the season was made on the 13th of December to the Waban Conservatories of Edmund M. Wood & Co., at Natick. These greenhouses are of very great extent, covering several acres of ground, and were at the time of our visit filled with roses in their different stages of development. Tea and tender roses predominated and they presented a most wonderfully healthy and vigorous appearance. Some of the houses were planted out in July last, and others contained plants which had been planted from one to three years. The houses face the south, are span roofed, and range from one hundred feet by twenty up to three hundred and fifty-five by twenty-four feet. Most all the tender roses were Brides and Bridesmaids, and they were coming into bloom very profusely.

The particular object of our visit was to examine a new house, three hundred feet long by twenty-four feet wide, planted in July last, with three thousand plants of the celebrated American Beauty

rose. This rose was discovered in General Bancroft's grounds at Washington some years ago, and it has proved of such superior excellence in size, color, and fragrance that it is grown by all our rosarians in the varied forms of perfection, as their knowledge of its wants extends. It would seem that Mr. Wood's head gardener, Alexander Montgomery, had conquered every obstacle in growing this rose to the limit of perfection, for this house presented the highest type of luxurious beauty ever seen by your Committee. The plants had each sent up on an average five stalks of flowers which would measure from four to six feet high, and with luxuriant foliage and not a speck of mildew in any of the houses. The knowledge of growing roses finely is not all confined to this estate, for nearly all the gardeners who have graduated from Mr. Montgomery's tuition have gone forth and put into practice the knowledge they have acquired while working in this magnificent establishment. Yet, when they attempt this task, they do not seem to have the knack that Mr. Montgomery possesses of putting on that fine finish and lusty appearance which culminates under his personal supervision.

This whole plant is run by four boilers, embodying four hundred and fifty horse power, with a further reserve of two other boilers in case of need. The annual amount of coal consumed is one thousand two hundred tons. Not content with this enormous plant as it now stands, and now turning out thousands of roses every day, Mr. Wood is about erecting two other greenhouses, each seven hundred feet in length, so as to enable him to produce a few more roses. We award the Waban Conservatories the first prize for a rose house.

The prizes awarded this year are as follows:

H. H. Hunnewell Triennial Premiums:

For an estate of not less than three acres, which shall be laid out with the most taste, planted most judiciously, and kept in the best order for three consecutive years:

First, A. F. Estabrook $160 00

Special Prize from the John A. Lowell Fund.

For the best house of Chrysanthemums arranged for effect, with other plants, in pots:

First, Mrs. B. P. Cheney 40 00

For the best house of Chrysanthemums grown on benches:
First, Col. Charles Pfaff 30 00

Society's Prizes.

For the best house of Foreign Grapes:
Second, William C. Winter 20 00
For the best house of Carnations:
First, F. A. Blake 30 00
For the best house of Roses:
First, Edmund M. Wood & Co. 40 00
For the best Vegetable Garden:
First, Col. Frederick Mason 30 00
Second, S. & F. E. Coolidge 20 00
For the best house of Cucumbers:
First, George D. Moore 30 00
Second, E. M. Bruce 20 00
For the best house of Tomatoes:
First, William Nicholson 30 00
Second, William C. Winter 20 00

Gratuities.

Mrs. David Nevins's estate 25 00
Warren H. Heustis, Strawberry Garden 30 00

Respectfully submitted,

PATRICK NORTON,
JOSEPH H. WOODFORD,
WM. WALLACE LUNT,
J. WOODWARD MANNING,
E. W. WOOD,
WARREN H. HEUSTIS,
HENRY W. WILSON,
JACKSON DAWSON,

Committee on Gardens.

REPORT

OF THE

Committee on School Gardens and Children's Herbariums

FOR THE YEAR 1899.

By HENRY LINCOLN CLAPP, CHAIRMAN.

One of the instructions concerning prizes for school gardens in the prize list of this Committee is this: "In determining the prizes reliance must be placed upon the descriptions of the principals in charge." Since the principal of the George Putnam School left the school for Europe two months before it closed and did not return till after November 1, he knew comparatively little about the management, condition, or use of the garden, and, accordingly, could not give a proper account of it. However, an adequate account written by Miss Katharine W. Huston, the principal's assistant, is herewith presented.

It is interesting to read that the old Quaker, George Fox, in 1691 willed a tract of land near Philadelphia "for a playground for the children of the town to play on and for a garden to plant with physical [medicinal] plants, for lads and lassies to know simples, and learn how to make oils and ointments."

It may also interest some persons to learn that on the 200th anniversary of that event (1891) the first school garden in Massachusetts was established on the grounds of the George Putnam School, Roxbury.

WILD GERANIUM

GEORGE PUTNAM SCHOOL GARDEN, ROXBURY.

The George Putnam School Garden was begun in the spring of 1891, in a small way, and for eight consecutive years has steadily increased in the number of its plants and in its usefulness to the school.

It now contains more than one hundred and fifty species of native flowering plants and ferns, some of which have propagated themselves to a somewhat remarkable extent.

Aster Novæ-Angliæ and *Viola cucullata* may always be depended upon to produce colonies in profusion. Besides these, *Viola Canadensis*, originally a handful, has given us in 1899 a mass measuring three feet by two, and has also migrated to the neighboring bed on the other side of the fence. *Viola striata* has grown from one small plant to a fine clump. *Polygonatum biflorum*

SENSITIVE FERN.

has sheltered under its scores of blossoming stems hundreds of its own seedlings in all stages of growth. *Oakesia sessilifolia* has not only spread itself profusely, but bore in 1899 flowers of phenomenal size. *Solidago lanceolata*, whose existence for the first few years seemed rather precarious, formed a bed this year measuring five feet by three feet and ten inches, its increase being due wholly to its own vigor. It was already budding when school closed, June 23d.

The other golden-rods have made great gains also, notably *S. juncea* and *S. latifolia*. *S. sempervirens*, although a seaside species, now forms a clump between five and six feet high, develops an abundance of very large flowers, and is a paradise for wasps, bees, and flies. Like Longfellow's chestnut tree, it "murmurs like a hive" through the month of September.

OSTRICH FERN.

The little Herb Robert has made its lodgment under the edges of stones and the rocky foundation of the fence, and has increased and multiplied as if it were a native of this garden. The Hog Peanut is very prolific and furnishes interesting material for decorative design

Iris versicolor and *Iris Pseudacorus* blossomed profusely this season, the latter bearing five or six flowers on every stalk. Two of the flowers were abnormal, one having four falls and three standards, the other five falls and two standards. In 1898 some of the flowers showed four fully developed falls and standards.

Aspidium acrostichoides, var. *incisum*, was set out in 1894 and has continued for five years to produce beautifully incised fronds, although this variation is said not to be constant.

In his report of the garden for 1896, Mr. Clapp called attention to the fact that many vigorous seedlings had sprung from the

CLAYTON'S FERN AND CINNAMON FERN.

different species of asters originally planted. In the three years since then their number has largely increased, and some interesting variations in color have been noticed. *A. Novæ-Angliæ* and its variety *roseus* have given us a long range of hues from rose to purple. *A. corymbosus* has produced a plant with pink blossoms. *A. acuminatus* has appeared with blue ray flowers.

Many other plants might be mentioned whose naturalization and increase make the garden a veritable bit of the country. In considering our garden we may say it consists not simply of the plants set out eight years ago and in the following years, but of those which have established themselves and which have led us to expect them, season after season, as surely as in their own homes.

Nothing has been said of the beauty and lavish flowering of the roses, cultivated irises, and hardy chrysanthemums, as the School

Garden proper is devoted to the native flora; but the cultivated plants just mentioned were a source of great pleasure while they lasted.

The unusually dry season of 1899 would have affected the garden very unfavorably, had it not been for the efforts of the janitor. By means of a lawn sprinkler he succeeded in keeping the conditions almost normal, and the garden was a most beautiful sight through May and June, while in September and October the asters and golden-rods were in their prime.

We make no provision for flowers which blossom only in July and August as they would be useless to the children, but rely upon those belonging to the spring and fall. We have found by experience that it is better not to make a practice of pulling up all the weeds in the beds, as they screen the earth and prevent too rapid evaporation.

In the spring and fall of 1899, nine classes made use of the garden, sometimes visiting it to observe and sketch the growing plants, and always finding abundant material for nature work in the schoolroom. The blossoming of five species of violets at one time gave an admirable opportunity for comparative work. The liliaceous plants formed another most interesting group. As soon as the crosiers made their appearance, daily visits were made to the fernery by the ninth grade. Each pupil drew a plan of it, locating the different species of ferns, and watching the development of the crosiers with great interest. The asters furnished large numbers of pupils with material for learning the structure of a composite flower, or for comparison with compositæ already studied.

Each child separated the ray flowers from the disk flowers, considered their arrangement, and compared the blossoms and leaves of several species, observing the difference in the size and color of the blossoms, and in the shapes and surfaces of the leaves. He then painted a spray of some aster, together with a single disk flower and a ray flower, afterwards writing a description of the plant.

We look upon the season through which the garden has just passed as the most successful in its history. The first report of it was published in 1891 under the title, "The School Garden Experiment." Having flourished for nine years without any relapse, it may fairly be considered to have passed beyond the

experimental stage, and to have become a permanent part of the equipment of the George Putnam School, especially for the grammar grades, which can make and have made the most extensive use of it.

In the report of 1898 it was said that the space used for a garden, 72×48 feet, is now so crowded with plants, mostly perennials, that additions have been nearly stopped for lack of room. It is proper to add in this connection that a plot of land of equal size in the girls' yard has already begun to be converted into a garden; and another plot of land, half an acre in extent, adjoining these gardens has recently been purchased by the city; and the Superintendent has suggested that this also should be used as a school garden. So it appears that there is room for almost indefinite expansion.

KATHARINE W. HUSTON.

REPORT ON THE MEDFORD SCHOOL GARDENS.

BY GEORGE E. DAVENPORT.

In submitting a report on the Swan and Curtis School Gardens, in Medford, Mass., it seems well to give a brief resumé of their history, and to include the report on the Curtis School Garden by the principal, Miss Amy W. Jones.

DEAR MR. DAVENPORT: I take pleasure in sending you a report of our school garden work the past year. The fall nature work in connection with bulbs proved very satisfactory, and the beautiful blossoms were also much enjoyed in the spring. This fall we have added to the number of cultivated flowering plants. We have continued our practice of adding to the wild flower collections, by bringing in roots whenever we make trips to the woods. Those already in the garden bloomed very nicely, so that we have been able to use a greater variety of specimens and material from the garden in our nature study, than in any preceding year. The children have taken entire care of the garden this year, spading, planting, weeding, etc. We intend to have the garden furnish practical lessons and to be a benefit to the schoolwork, so that the boys and girls will feel that they know how to start gardens for themselves at their homes.

We have had four new beds made for seed planting. We devoted quite a space to vegetables — corn, beans, peas, onions, carrots, potatoes, etc., and watched the results closely. In this the boys were especially interested.

With this report I enclose two photographs, one of which shows some of the largest pupils at work, and the other a fern and wild flower corner.

Respectfully submitted,

AMY WHITMORE JONES.

Curtis School, Medford.

Nov. 16, 1899.

The Swan School Garden was established in April, 1895, with the means furnished by the School Garden Committee of the Horticultural Society, and a subscription fund from citizens of Medford who were favorable to the plan.

Between twenty-five hundred and three thousand feet of land along the inside of the fence line was laid out into beds, spaded, and thoroughly worked over with rich loam and rotted manure to a depth of nearly two feet and made ready for planting.

Arbor Day (April 26) was chosen for the dedication of the garden, and the children were given an outdoor object lesson in the planting of the seed of *Catalpa speciosa*, one of the grandest of our native trees.

Special exercises were prepared and arranged so that every child could participate, and Miriam Davenport Gow, the youngest child in the school at that time, was chosen to plant the seed. After the planting of the seed each child in turn threw over it a handful of earth at the same time reciting an appropriate verse. The exercises were further carried out by the singing of appropriate songs by the children, and a pleasant address by Rev. Henry C. DeLong. The children were greatly pleased with the thought of raising a school tree from the seed, and watched eagerly for the appearance of the young seed tree which came later on.

At this time also two native trees, *Liriodendron Tulipifera*, the Tulip tree, and *Cladrastis tinctoria*, the Virgilia or Yellow-Wood tree, were planted, and in this way the development of the garden began.

CURTIS SCHOOL GARDEN.

Believing it to be wiser, where there are young children to deal with, to begin with a mixed garden, certain portions were set aside exclusively for native plants, and the children were given permission to bring and plant, under the direction of their teachers, such seeds and plants as they chose in the other beds. The result was even more gratifying than was expected for the first season, as the second prize offered by the School Garden Committee was won, besides a special prize for the best collection of flowering plants and the commendation of the Committee. [See Report for 1895.]

Subsequently some unfortunate circumstances prevented a further development of the garden until 1898, when interest in it revived, and the present year has surpassed all previous ones in the character of the work accomplished.

While certain portions are still kept apart for the children to grow nasturtiums, pansies, geraniums, and such other flowers as children love, the proportion of native plants has steadily increased, until at the present time nearly one hundred and fifty species and varieties of wild flowers, native shrubs, and ferns are planted in the garden.

Experience in transplanting in this garden indicates that the fall is the best time to take up and remove most plants as they are less liable to be seriously affected by the disturbance. Some plants that were transplanted under unfavorable conditions have failed to establish themselves thoroughly, and will have to be replaced, but the greater number have succeeded in doing so, and are now fairly well established. The capacity of the garden is so great that for a long time to come it will be difficult, if not impossible, to overstock it. In setting out plants every possible effort has been made to imbed them in as much of their natural soil as can be obtained.

An attractive feature has been the children's rockery, which they have kept in excellent condition. Violets, hepaticas, anemones, blood-root, columbines, corydalis, and some others have bloomed from the crevices in their order of succession, while fine clumps of the shield ferns, spleenworts, Woodsias, and Polypody have added greatly to its charm.

Throughout the season the garden has received the best of care and the children have made frequent use of it for their nature work.

CORNER OF CURTIS SCHOOL GARDEN.

One of the attractions for passers by has been the children out with their teachers making observations and drawings of living plants, and some of these drawings have been considered worthy of selection for sending to the international exhibition.

The Curtis School Garden is the legitimate outgrowth from the nature work which this school was the first in Medford to take up, under the inspiration of the late Miss Laura Davenport. The garden has been under the care of Miss Amy W. Jones, the principal, from the beginning. In 1898 it received the second prize.

School-garden work in Medford is to receive still further re-enforcement another year by the establishment of a garden at the new Brooks Grammar School, at West Medford, under the supervision of Mr. Lewis F. Hobbs, the principal, and at the Washington Grammar Miss Winifred L. Evans has been fortifying her excellent work on ferns by an outside fernery, which the School Garden Committee trusts will lead to an enlargement of garden work on the Washington School Grounds.

The following list records the more important native plants that have been added to the Swan School Garden during the past two seasons:

Acer Pennsylvanicum, L.
" *spicatum*, Lam.
Actæa alba, Bigelow.
" *spicata*, L. var. *rubra* Michx.
Adlumia cirrhosa, Raf.
Amelanchier Canadensis, Torr. & Gray.
Ampelopsis quinquefolia, Mich.
Andromeda polifolia, L.
Asclepias quadrifolia, Jacq.
Aster cordifolius, L.
" *corymbosus*, Ait.
" *dumosus*, L.
" *lævis*, L.
" *macrophyllus*, L.
" *miser*, L.
" *multiflorus*, Ait.
" *patens*, Ait.
" *puniceus*, L.
Aster Tradescanti, L.
" *undulatus*, L.
Azalea Vaseyi.
Baccharis halimifolia, L.
Cassandra calyculata, D.
Ceanothus Americanus, L.
Celastrus scandens, L.
Chelone glabra, L.
Clematis Virginiana, L.
Clintonia borealis, Raf.
Comptonia asplenifolia, Ait.
Coptis trifolia, Salisb.
Cornus florida, L.
Corydalis glauca, Pursh.
Cypripedium acaule, Ait.
Desmodium paniculatum, D. C.
Diervilla trifida, Mœnch.
Diplopappus linariifolius, Hook.
Echium vulgare, L.
Eupatorium sessilifolium. L

Eupatorium teucrifolium, Willd.
Gerardia pedicularis, L.
Goodyera pubescens, R. Br.
Helianthus divaricatus, L.
Hibiscus Moscheutos, L.
Hieracium venosum, L.
Hudsonia tomentosa.
Impatiens pallida, Nutt.
Ledum latifolium, Ait.
Lilium Canadense, L.
" *Philadelphicum*, L.
Liparis liliifolia, Rich.
Lonicera sempervirens, Ait.
Lysimachia radicans, Hook.
Maruta Cotula, D. C.
Menyanthes trifoliata.
Mitchella repens, L.
Myosotis palustris, Withering.
Myrica cerifera, L.
Nemopanthes Canadensis, D. C.
Œnothera biennis, L.
Orchis spectabilis, L.
Polygonatum biflorum, Ele.
" *giganteum*, Dietrich.
Prunus pumila, L.
Quercus Prinus, L. var. *humilis*, Marsh.
Ranunculus fascicularis, Muhl.
Sericocarpus solidagineus, Nees.
Smilacina bifolia, Ker.
" *racemosa*, Desf.
Solidago bicolor, L.
" *cæsia*, L.
" *Canadensis*, L.
" *lanceolata*, L.
" *nemoralis*, Ait.
" *puberula*, Nutt.
Streptopus amplexifolius, D. C.
Thalictrum Cornuti, L.
Trientalis Americana, Pursh.
Uvularia grandiflora, Smith.
" *sessilifolia*, L.
Vaccinium Vitis-Idæa, L.
Verbena hastata, L.
Viburnum acerifolium, L.
" *dentatum*, L.
" *lentago*, L.
Viola canina, L. var. *sylvestris*, Regel.
Viola cucullata, Ait.
" *lanceolata*, L.
" *pubescens*, Ait.
" *sagittata*, Ait.

89 species. Previously recorded 31 species.
Total 120 species,

to which are to be added several native shrubs donated from the Arnold Arboretum.

Ferns.

Phegopteris Dryopteris, Feé.
Ophioglossum vulgatum, L.
Botrychium Virginianum, Swr.

3 species. Previously recorded 27 species.
Total 30 species, including several varieties.

FRAMINGHAM SCHOOL GARDEN.

REPORT ON SCHOOL GARDEN OF FRAMINGHAM STATE NORMAL PRACTICE SCHOOL.

The establishment of a school garden in connection with a state normal school is an event of more than ordinary importance, because teachers are likely to become interested in the growth of plants and then to interest their pupils in the same direction. The teacher may be the source of inspiration in carrying on garden work for many a year and wherever she goes. To start with the teacher is to start in the right place. So the Normal School in Framingham may be called the pioneer in school garden work in New England at least. Concerning the work there something may be learned from the following extracts from an interesting letter written by Miss J. Angelina Smith, of the Framingham State Normal Practice School:

"The garden was started in the spring of 1897 with a few plants which were the survivors of a wild garden kept up by Miss Hyde for years.

This spring it was enlarged and a walk was added, and this fall all the shrubs, except two forsythias, were put in.

The violets furnished material for several drawing lessons in the spring, and this fall the new class has become much interested in ferns, studying them in the garden and in other localities, with the aid of microscopes, both simple and compound.

Last year and this year so far it has been cared for and enlarged by the eighth grade pupils. The boys have shown fully as much interest as the girls and have hunted woods and meadows to see who could get the most beautiful plants.

WILD GARDEN, NORMAL PRACTICE SCHOOL, FRAMINGHAM, MASS.

FILICES.

Osmunda regalis.
" *cinnamomea.*
Onoclea sensibilis.
Aspidium spinulosum.
" *marginale.*
Asplenium ebenoides.
" *Filix-fœmina.*
Adiantum pedatum.
Dicksonia pilosiuscula.

SHRUBS.

Forsythia.
Clematis Virginiana.
Sambucus Canadensis.
" *pubescens.*

Hamamelis Virginiana (Witch-Hazel).
Ilex verticillata.
Viburnum lentago.
Berberis vulgaris.
Rosa rubiginosa.

COMMON FLOWERS.

Sanguinaria Canadensis.
Aquilegia Canadensis.
Gentiana Andrewsii.
Smilacina racemosa.
Hepatica triloba.
Anemone nemorosa.
" *thalictroides.*
Viola pedata (white).
" *palmata* var. *cucullata.*
" *sagittata.*
" *blanda.*
" *lanceolata.*
" *Canadensis.*
" *pubescens.*

WENHAM SCHOOL GARDENS.

In the early spring a prize was offered to the five district schools of Wenham for the best school garden which should be started and maintained during the summer.

A commendable effort was made by each school, which has greatly improved the appearances of the school yards and aroused a new interest among the children.

A sketch of the school garden winning the prize may be interesting. Here was a school of twenty-five children, of ages ranging from five to thirteen years, and representing a dozen families, nearly all farmers or laborers.

The school house stands on a little plot of land overgrown with tansy — neglected and desolate in the extreme. It seemed a formidable task for such a school to grapple with a school garden.

Under the guidance of their most enthusiastic teacher, Miss Alta Hill, the children first planned out what they would try to accomplish the first year. The beds and banks were carefully staked, and as fast as the work could be done, each bed was dug out two feet deep — some three — and filled in with good loam. The digging was mainly done by the parents and friends of the school, and the loam, more than thirty two-horse loads, was given by them also.

The children cut the turf and outlined the beds, while the little ones hauled in their carts all the loam for two large beds.

On one side of the school house a fern bed was made. This the children with their teacher did entirely, planting out ten species of our native ferns.

Before the beds were ready for planting, the season was so far advanced that only two clumps of native shrubs, one of sumach and one of barberry, could be planted; the remaining beds were filled in with perennials and seedlings, and the result has been a most attractive school yard all summer.

The devotion shown by the teacher and pupils in keeping alive, during this unusually dry season, all that was set out, has been almost heroic. Each night after school, everything was thoroughly watered, the water being carried in cans from a brook some distance away.

This autumn they plan to add clumps of a half-dozen more native shrubs, and several new ferns. The small beds for study have been made ready for single specimens of the native flowering plants.

The prize money will be expended on garden tools, and cultivated shrubs and perennials.

It has been no small impetus to the children to know they were working with the Horticultural Society, and they are looking forward to competing for the Society prize another year.

A. P. Cole.

SCHOOL GARDEN AT BATH, MAINE.

Bath, Me., Dec. 5, 1899.

Mr. Henry L. Clapp, *Chairman of School Garden Committee:*

Dear Sir: The following plants were added to the Bath High School Garden during the season of 1899:

Adiantum pedatum.	*Erythronium Americanum.*
Amphicarpæa monoica.	*Hypericum Canadense.*
Bidens frondosa.	*Lobelia inflata.*
Brunella vulgaris.	*Rudbeckia hirta.*
Chelone glabra.	*Spiranthes cernua.*
Coptis trifolia.	*Verbena hastata.*
Diervilla trifida.	*Viola Canadensis.*

Some other plants have been set out to replace those which died in the previous season.

Since the garden was begun in 1896 some species have spread to a considerable extent, noticeably *Aspidium Noveboracense* and *Oakesia sessilifolia*.

I hope to increase both the size and usefulness of the garden next year.

With thanks for the generous encouragement given me by your Committee, I am

Very truly yours,

VIOLA G. HOGAN.

AN INTERESTING PAPER.

Dr. F. M. Powell, Superintendent of the Institution for Feeble-minded Children in Glenwood, Iowa, on the 14th of December, 1899, read a very able and suggestive paper on "School Gardens" before the Iowa State Horticultural Society. The paper, fortunately, was put into print and a copy was sent to the Chairman of this Committee, who would gladly quote from it at length, were his own report not so long, but will content himself with quoting a few of the interesting sentences with which the report abounds.

"Through information submitted by a Committee on School Gardens and Children's Herbariums, appointed by the Massachusetts Horticultural Society, I believe this state may justly claim the nearest approach to the ideal school gardens."

"Some one has said 'Kindergartners want the earth.' Yes, that is just what will content us, and the children, too — a small patch of Mother Earth, where each child may have his own little garden bed; where he may raise a few vegetables; where he may handle a rake, a spade, and a hoe; where he may delight, if possible, in a watering-pot and a wheelbarrow; where he may dig and plant; where he may watch and wait and reap. It is not only figuratively, but literally, that kindergartners want the earth."

"One of the most interesting and encouraging letters I have received is from a kindergartner in St. Louis who, with the help of eighty pairs of little hands, transformed an old brick-paved yard, twelve by twenty-four feet, into a real, live, flower garden. This yard had been a playground for many years in the lower part of the city where children came from crowded tenements. The children loosened and removed the bricks, afterwards using them as

boundaries. They made beds, transplanted vines from the kindergarten room, planted seeds, trained vines, and took turns in watering the garden."

"A little boy on being taken to a kindergarten thus expressed his disappointment at what he saw, or, rather, at what he did not see: 'Why, it isn't a garden at all.'"

"Three years ago I directed the florist and gardener to plant flowers in ten feet of space next to the Boys' Cottages. The experiment proved a success in improvement of the grounds, protection to buildings, and object lessons for the boys. The flowers have not been rudely molested in any instance, but tenderly cared for. For the last two years vegetable gardens have been successfully cultivated by the children."

GERMAN SCHOOL GARDENS.

In 1899 the Chairman of the School Garden Committee visited a number of school gardens in Germany and learned from the directors much about the extent, stocking, and management of them and the character of the instruction given in them. Those established in Pössneck and Gera were particularly interesting on account of their size, complete equipment, and usefulness to a large number of children. Each is not far from an acre in area and forms an important factor in the educational system of the city in which it is situated.

Since a large proportion of the pupils in German public schools are destined to till the soil, school authorities there consider that it is quite as important that children should be taught early and thoroughly how to cultivate plants as that they should be taught how to read the masterpieces of literature with the rising and falling inflections in their proper places; consequently, the children know the requirements of plant growth long before they are introduced to Schiller and mythology.

In the Pössneck garden the children have the privilege of choosing what they will plant, vegetables or flowers or both; and most of them choose to raise with their vegetables some lovable plants—those with brilliant blossoms and interesting habits, alpine plants, gentians, harebells, primroses, asters, etc. Out of 533 plant beds made and cultivated by the pupils 350 beds contained both flowers and economic plants, such as aromatic herbs, plants producing oil,

plants having fibres which are used in spinning, grains, medicinal plants, poisonous plants, and various kinds of bulbous and tuberous plants. Each kind forms a separate group. Attention is also given to the native shrubs and the evergreen and deciduous trees of the province.

The pupils of eight grades work in the garden an hour a day—sometime from five to seven o'clock in the afternoon. The notes which they take in the garden serve as a basis for compositions on the various kinds of work connected with farm life. Fertilizing, rotation of crops, the effect of the presence or absence of light, heat, or moisture, the birds and insects injurious or helpful to cetrain kinds of plants, and many other kindred topics are written upon. As a consequence the Germans are expert farmers. A ride on a steam train through any of their farming districts would convince an observer of that fact.

A considerable amount of such work in connection with our public schools, especially in the West, would make young people more contented and successful in farming and keep them from rushing into the cities to become clerks, conductors, and genteel non-producers.

The school garden in Gera, although only three years old, now has 800 species of plants; but the director, Mr. Robert Leube, assured me that in three years more there would be 2400 species in the garden.

A novel feature of this garden is a collection of the geological specimens to be found in East Thuringia. The collection is arranged so as to represent the lay, dip, fault, uplift, etc., of geological strata, and the whole artistically and scientifically conceals the perennial spring of water upon which the success of the garden is so dependent.

As in the Pössneck garden, plants of the same family or economic class are grouped together, the tall and quick growing trees being located in the northern part so that their shadows fall away from the garden. There is a basin for aquatic plants, a rockery for Alpine and rock plants, an extensive fernery, and an abundance of umbrageous shrubs under whose dense foliage wood plants find congenial homes.

To this garden hundreds of children come with their teachers regularly to receive instruction in plant life. They do not work in it with garden tools, as the children do at Pössneck.

In Dresden I had the great pleasure of a visit from Dr. O. W. Beyer, one of the most earnest advocates of school garden work in Germany. About the time in which he was school director in Pössneck, some fifteen years ago, he published a book of two hundred pages called "Naturwissenschaften in der Ertziehungsschule" which treats of all forms of manual training suitable for school children. Apparently all the German school gardens are laid out precisely along the lines marked out by Dr. Beyer in his chapter on school gardens. He did not succeed in establishing the garden during his term of office, the burgomaster of that time being indifferent to the matter; but he sowed the seed that enabled his successor, Dr. Lotz, to found the garden with the aid of the new burgomaster, who favored the enterprise in every way.

The consideration of other school gardens and the mention of other advocates of them must be put aside for another time, on account of the unusual length of this report.

SCHOOL GARDEN PRIZES.

In competing for and determining the prizes offered for the establishment, maintenance, and use of school gardens, I recommend the careful consideration of the following points, mentioned in the order of their relative importance:

1. Adherence to the printed instructions; at least such instructions should be considered of primary importance, and other meritorious points, not mentioned in the instructions, of secondary importance. No rule should be established to bolster up a particular case.

2. It is of the highest importance that the actual use of the garden as an educational means should be illustrated and manifested by pupils' work in drawing, painting, and writing on paper, where cramming and copying can be detected and judged according to its merits if any. The extent to which the pupils' proper work is carried out through the school and the individuality of each pupil's work are important determinants. The genuineness of the work should be evident on the face of the papers; the tracks of the pupils, their excellences and deficiencies should be apparent.

3. Next in importance are snap-shot photographs of pupils sketching, watering, hoeing, digging, comparing, etc. — *not posing*, but really at work in the garden and in unconscious positions.

Time pictures of pupils and teachers in conscious postures, *attitudinizing*, with no evidence of using the garden as a regular source of instruction, should be considered of little value in reference to the real merits of a school garden.

4. Aids to judgment may be furnished by means of photographs of individual specimens or clumps of plants, or of the garden as a whole, to illustrate the abundance, vigor, and blossoming power of plants and their variation under cultivation. So far as such photographs illustrate such points they are helpful; but they do not furnish any evidence that the garden is connected with the school in any vital way.

5. The amount of work done in stocking a garden in a single season is worthy of consideration and should entitle it to a gratuity of some sort proportioned to the amount and quality of the work done; but to award a prize mainly for such work might establish a troublesome precedent. Some enterprising florist might take a notion to stock a garden to advertise his plants. So it is important to consider who does the work and who keeps the garden running.

6. Other things being equal, the garden established and sustained by the teachers and pupils of the school is preferable to that established by an influential or wealthy patron, since the latter, by reason of the uncertainties of wealth and elections, is less likely to be permanent. Interested teachers being on the ground for many years are much more likely to make a close connection between the school and the garden; therefore *reports of what the teachers and pupils really do, written out by themselves* in black and white or illustrated by color *regularly*, are of paramount importance. The garden unrelated to the school has no more educational value than any other private flower or vegetable garden. The garden plus the work of the school with and in it must be considered in determining prizes; and there should be unmistakable evidence that the material for instruction found in the garden has been used regularly, and perhaps it might be added, skillfully, in case of a garden of the highest type and usefulness. Indefinite statements in regard to the enjoyment of the garden, proposed work, etc., are proper enough in the beginning, but they should have no weight in determining prizes.

HENRY L. CLAPP,
Chairman Committee on School Gardens and Children's Herbariums.

CHILDREN'S HERBARIUMS.

Over seventeen hundred herbarium specimens were exhibited in Horticultural Hall, December 1 and 2, 1899. Fortunately this year all the specimens were well displayed, no collections being put under the tables for lack of room, as was the case last year. The tables in both halls were comfortably filled with mounted specimens, which in workmanship were fully equal to any that have been exhibited in previous years.

Vanessa Denton's collection of one hundred and twenty-five specimens was the finest, the arrangement and mounting of the specimens being exceptionally good and the coloring of the flowers being well preserved. Her collection was the best in the exhibition last year. She has exhibited three times.

In previous years George E. Nichols has shown four hundred and fifty-seven specimens and this year he made important additions — seventy-eight flowering plants, thirty-one ferns, ten grasses, and two sedges — having begun to exhibit in 1894, and having exhibited in all five hundred and seventy-eight specimens.

Two Italian boys, William Ghirardini and Charles A. Tosi, from the North End, sent in very good collections. They got their specimens from Franklin Park and vicinity. When they were at the exhibition some one said in their hearing that it was considerable trouble to press plants. One of the Italian boys expressed a contrary opinion, and to show how thoroughly he had mastered the art of pressing plants said, "When I get into the cars with my plants I sit on 'em."

Three brothers, John Murdock, Jr., Richard Murdock, and Joseph Murdock, together sent in over three hundred specimens.

Three members of the French family, Arthur E., Olive L. and Marion L., exhibited two hundred and twenty-seven specimens, all finely mounted. Arthur E. has exhibited five years in succession, and Olive L. three. Marion L., who is only seven years old, exhibited twenty-five flowering plants as her first collection.

Anna M. Christian showed *Aspidium simulatum* Davenport in her fern collection, this being the first time this fern has been shown by a child at our herbarium exhibition.

At different times the curator of the Fairbanks Museum in St. Johnsbury, Vt., and Mr. Jones, Superintendent of Public Schools,

in the same place, visited the George Putnam School to get information concerning the means of interesting children in elementary science work, school gardens, and herbariums. The reports and prize lists concerning the work done by your Committee were taken away by Mr. Jones who had printed a circular very similar to our prize list, instructions and all; and we are very glad to have such good use made of our material. Excluding "Directions for Competitors," the circular is as follows:

THE FAIRBANKS MUSEUM PRIZES FOR CHILDREN'S HERBARIUMS.

The generosity of friends of the schools has made possible the offer of prizes bearing the above name. The competition is open to pupils enrolled during the year 1898 in grades VI to IX of the schools of the Town of St. Johnsbury. The collections for which prizes are offered are as follows:

	1st. Prize.	2d. Prize.
For 100 species of herbaceous flowering plants,	$5.00	$3.00
" 50 " " " " "	3 00	1.00
" 30 sprays of leaves of trees or shrubs, different species,	3.00	2.00
" 20 sprays of leaves of trees or shrubs, different species,	2.00	1.00
" 25 species of ferns,	4.00	2.00
" 15 " " "	2.00	1.00

It is expected that during the spring term the teachers will assist pupils in starting their herbariums by showing them how to collect, press, mount, and name the plants. With the instruction given pupils should be able to continue the work during the summer vacation. The co-operation of parents in this enterprise is particularly desired by the school management.

The prizes will be awarded at an exhibition of the collections to be held during the month of November, 1899. At this exhibition, collections not entered for prizes may be shown, and specimens not included in the groups of plants mentioned will be welcomed.

PRIZES AND GRATUITIES AWARDED FOR SCHOOL GARDENS AND CHILDREN'S HERBARIUMS.

SCHOOL GARDENS.

George Putnam School, Roxbury, first prize	$15 00
Swan School, Medford, second prize	12 00
Curtis School, Medford, third prize	10 00

CHILDREN'S HERBARIUMS.

FLOWERING PLANTS.— For one hundred and twenty-five specimens:	
First prize, John Murdock, Jr.	$5 00
Second, Helen Robinson	4 00
For one hundred specimens:	
First prize, Robert D. Morss	4 00
Second, Ruth Robinson	3 00
For seventy-five specimens:	
First prize, Philip Morss	3 00
Second, Edith Taft	2 00
For fifty specimens:	
First prize, Charles A. Tosi	2 00
Second, William Ghirardini	1 50
For twenty-five specimens:	
First prize, Marion L. French	1 50
Second, Joseph Murdock	1 00
For ten specimens:	
First prize, Winthrop Swain	75
Second, Richard Murdock	50
Gratuities:	
Vanessa Denton, for one hundred and twenty-five additions	5 00
John Murdock, Jr., for one hundred additions	2 00
Bessie R. Parmenter, for one hundred additions	2 75
Olive L. French, for ninety-two additions	2 75
George E. Nichols, for seventy-eight additions	3 00
Arthur E. French, for seventy-five additions	3 00
Stanley Webb, for seventy-five specimens	1 00
Melora E. Warner, for fifty specimens	2 00
Leonard A. Page, for ten additions	25
FERNS.— For thirty specimens:	
First prize, Genevieve Doran	5 00
Second, George E. Nichols	4 00
For fifteen specimens:	
First prize, John Murdock, Jr.	3 00
For ten specimens:	
First prize, Katherine L. Driscoll	2 00
Second, Anna M. Christian	1 00

For five specimens:		
First prize, George E. Cassidy		75
Second, Richard Murdock		50
Gratuities:		
Melora E. Warner, for fifteen additions		3 00
Theresa Gambetski, for ten specimens		75
SEDGES.— For thirty specimens:		
First prize, Olive L. French		3 00
For twenty specimens:		
Second prize, John Murdock, Jr.		1 00
GRASSES.— For ten specimens:		
First prize, John Murdock, Jr.		1 00
Second, George E. Nichols		50
Total for Gardens and Herbariums		$112 50

The amount of money appropriated by the Society for the use of the Committee was		$250 00
Awarded for School Gardens	$37 00	
Awarded for Herbariums	75 50	
Printing and paper	30 25	
Expressage, stamping, postage	11 75	
Advertising	8 40	
		162 90
Balance unexpended		$87 10

HENRY L. CLAPP, *Chairman*, Roxbury,
GEORGE E. DAVENPORT, Medford,
MISS KATHARINE W. HUSTON, Roxbury,
CHARLES W. JENKS, Bedford,
WILLIAM P. RICH, Chelsea,
MRS. P. D. RICHARDS, West Medford,
MRS. M. L. STEVENS, Cambridge,
W. E. C. RICH, *Secretary*,
99 Moreland Street, Roxbury, Mass.

Committee on School Gardens and Children's Herbariums.

REPORT

OF THE

COMMITTEE ON NATIVE PLANTS.

The exhibition of native plants is always an interesting feature of the Society's work, and has become one of its most important on account of its helpfulness to the cause of education in our public schools. These exhibitions, which have been wisely encouraged by the Society, have been fully appreciated by the large number of visitors who have been attracted by them. Especially valuable and helpful have they been to teachers and others who are interested in nature work in our schools, and great benefit must inevitably accrue to the community as a result.

Not only do they enable those who are botanically inclined to study and compare specimens in a living state, but, extending from early spring until late autumn, they assist in making known to the general public the most attractive portion of our New England Flora. This, in connection with the invaluable collections of Fungi exhibited by the Boston Mycological Club, serves to make Horticultural Hall the Mecca for all who are interested in our native plants.

The enthusiasm of the exhibitors is noticeable, and the untiring industry with which they seek out and arrange for exhibition plants seldom seen is worthy of much higher recognition than it now receives. When to this is added the care taken by them to preserve from destruction the choicer of our native plants, and the sacredness with which they guard the little known localities of rare plants, much praise should be given to them.

Unfortunately, the corps of exhibitors was weakened early in the season by an accident to Mrs. Percival D. Richards, of West Medford, whose exhibits of rare native plants have for some years made her name widely known.

The Committee deplore their inability under present rules to provide for some recognition of an exhibit which fails to receive a prize when of unusual merit, and hope that some way may be found for overcoming this difficulty.

There has been no competition for the prizes for cultivated native plants, and only two entries, perhaps owing to the small amount offered, and the Committee feel that the amount should be increased.

There has, however, been shown almost weekly during the season, but not for competition, a series of exhibits of cultivated native plants from the garden of Robert Manning, aggregating a collection of such a character that the Committee deems it worthy of special and honorable mention.

CULTIVATED NATIVE PLANTS EXHIBITED BY R. MANNING, 1899.

MAY 6.

Lindera Benzoin.
Hepatica triloba.
Viola cucullata.
Viola odorata.
Sanguinaria Canadensis.
Dicentra sp.

MAY 13.

Trillium grandiflorum.
Viola pubescens, var. *scabriuscula.*

MAY 20.

Asimina triloba.
Amelanchier Canadensis.
Cercis Canadensis.

MAY 27.

Podophyllum peltatum.
Arisæma triphyllum.
Smilax herbacea.

JUNE 3.

Polygonatum biflorum.
Dodecatheon Meadia.

JUNE 7.

Arisæma Dracontium.
Viola Canadensis.

JUNE 10.

Anemone Pennsylvanica.

JULY 15.

FERNS.

Onoclea Struthiopteris.
Osmunda cinnamomea.
" *Claytoniana.*
" *regalis.*
Adiantum pedatum.
Asplenium Filix-fœmina.
Aspidium acrostichoides.

JULY 22.

Dioscorea villosa (pistillate). *Campanula rotundifolia.*

JULY 29.

Hibiscus Moscheutos.

AUGUST 5.

Lilium superbum.

AUGUST 12.

Liatris pycnostachya.
" *spicata.*
Impatiens fulva.
Clethra alnifolia.

SEPTEMBER 16.

Phytolacca decandra.
Arisæma triphyllum in fruit.
Aster Novæ Angliæ.
" " " var. *roseus.*

SEPTEMBER 28.

Celastrus scandens in fruit.

Some of these, such as *Trillium grandiflorum*, *Podophyllum peltatum*, *Arisæma Dracontium*, *Hibiscus Moscheutos*, *Phytolacca decandra*, and some of the ferns showed much improvement in size and other respects from cultivation.

The character of the exhibitions has been well sustained throughout the season, and the Committee has been glad to welcome two new exhibitors, Miss Edith Noyes and Miss R. L. Mann.

April 22. — Mrs. Percival D. Richards made one of her characteristic exhibitions of early spring flowers, mostly violets, bloodroot, and *Draba verna*, and on the 29th, Miss Alice L. Grinnell exhibited a fine collection of thirty species of spring plants, among them five species of violets and *Claytonia Virginica*. A gratuity was awarded to each.

May 6. Mrs. Richards, Miss Grinnell, and the Misses Eleanor A. and Mollie S. Doran exhibited beautiful collections, containing nearly all of the early May flowers, and received the first, second, and third prizes in the order named.

Miss Grinnell's collection contained nine species and varieties of violets, *Corallorhiza innata*, *Trillium erythrocarpum*, and *Actæa alba*. That of the Misses Doran was of uncommon excellence and deserving of special mention, while that of Mrs. Richards, as usual excelled in the number of the rarer of our early spring flowers.

May 13. A gratuity was awarded to Mrs. P. D. Richards.

May 20. Gratuities were awarded to Mrs. Richards and the Misses Doran.

May 27. A gratuity was awarded to Mrs. Richards.

On June 7 and 8 (postponed dates), prizes for native plants were awarded to Miss Grinnell, Mrs. Richards and the Misses Doran, in the order named.

Among the more interesting plants of this exhibition were:

Lupinus perennis,
Lathyrus maritimus,
Clintonia borealis,
Asarum Canadense,
Hottonia inflata,
Lonicera sempervirens,
Polygala paucifolia,
Sarracenia purpurea,
Kalmia latifolia,
Pogonia verticillata,
Arethusa bulbosa,
Liparis liliifolia,
Asclepias quadrifolia,
Utricularia minor,
Castilleia coccinea,
Aphyllon uniflorum,
and three *Cypripediums*.

June 10. Miss Edith Noyes made her first appearance as an exhibitor with a splendid collection of forty-two species and varieties, receiving a gratuity therefor.

July 1. The Misses Doran exhibited fifty-seven, and Miss Grinnell fifty-four species and varieties, well arranged and showing the early July wild flowers to good advantage. A gratuity was awarded to each.

July 8. Miss Grinnell, Mrs. W. S. Eager, and Miss Noyes, in the order named, were awarded prizes. There were also some fine collections from the Misses Doran and Miss Genevieve Doran that were worthy of special mention.

July 15. Miss Edith Noyes was awarded the first prize for cultivated native plants, Miss Grinnell and Genevieve Doran gratuities for wild flowers, and C. C. Kingman, Miss Grinnell, and the Misses Doran, in the order named, were awarded the prizes for hardy (native) ferns.

July 22. Gratuities were awarded to Edith Noyes, Genevieve Doran, the Misses Doran, and Miss Grinnell for native plants.

July 29. Miss Grinnell, Miss Noyes, and Mrs. Eager were awarded first, second, and third prizes in the order named. There was also a collection from the Misses Doran that was worthy of special menton.

August 5. Miss Grinnell exhibited another of her fine collections for which she was awarded a gratuity.

Sabbatiu chloroides,	*Goodyera repens*,
Coreopsis rosea,	*Cassia Marilandica*, and
Lobelia cardinalis,	*Chimaphila maculata*

were some of the rarer plants of this exhibit.

August 12. Miss Noyes was again awarded the first prize for cultivated native plants, thus entitling her to the Appleton Bronze Medal.

At this exhibition also, the Misses Doran had a splendid collection of uncultivated native plants, containing seven species of golden-rod, four asters, three Eupatoriums, and eleven ferns. Miss R. L. Mann also had an excellent display, and both were awarded gratuities.

August 19. The Misses Doran exhibited an unusually fine collection of ten golden-rods and twenty ferns, Miss Grinnell a splendid collection of midsummer plants, and on the 26th, another collection nearly as fine. Miss Mann also made a praiseworthy exhibit on the 19th. A gratuity was awarded to each.

August 26. A gratuity was awarded to Miss Grinnell.

August 29. The Misses Doran were awarded the first, Miss Grinnell the second, and Miss Mann the third prize for their collections.

Mrs. Eager also exhibited a fine collection, and Walter E. Coburn a superb collection of native grasses. A gratuity was awarded to Mr. Coburn.

Among the novelties of this exhibition was *Lysimachia* (*Steironema*) *radicans* Hooker, credited in the Manual to "West Vir-

ginia and southward," but found by Miss Grinnell quite well established, and shown here by her for the first time.

September 9. A special gratuity was awarded the Misses Doran for a superb collection of native plants in fruit. Gratuities were also awarded Miss Grinnell and Miss Mann, and again to Miss Grinnell and the Misses Doran on the 23d.

November 7. The Misses Doran were awarded a gratuity for a beautiful collection of native ferns, evergreens and plants in fruit.

THE AMOUNT AWARDED IN PRIZES AND GRATUITIES IS AS FOLLOWS:

Mrs. P. D. Richards	$19 00
Miss Alice L. Grinnell	59 00
Misses E. A. and M. S. Doran	37 00
Miss Edith Noyes	19 00
Mrs. W. S. Eager	10 00
Miss R. L. Mann	7 00
Walter E. Coburn	3 00
C. C. Kingman	6 00
Miss Genevieve Doran	2 00
Total	$162 00

AMOUNT OF APPROPRIATIONS FOR NATIVE PLANTS.

5 exhibitions, 3 prizes at each, 8, 6, 4 = 18			$90 00
3 " Cultivated Natives, 3 prizes, 3, 2, 1 = 6			18 00
1 " Hardy Ferns, 3 prizes, 6, 5, 4			15 00
Total amount for prizes			123 00
Appropriation for gratuities			50 00
Total amount			$173 00
Awards. Prizes for Native Plants	$90 00		
" " Cultivated Native Plants	6 00		
" " Hardy Ferns	15 00		
Gratuities	51 00		
Total			162 00
Balance			$11 00

MEDALS AWARDED.

Appleton Silver Medal to Miss Alice L. Grinnell for three first prizes for native plants.

Appleton Bronze Medal to Miss Edith Noyes for two first prizes for cultivated native plants.

The Committee would have liked to award the Society's Silver Medal to Robert Manning for special exhibits of cultivated native plants made by him during the season if the appropriations at its disposal would have warranted its doing so, but finds itself obliged to be content with a special and honorable mention.

Respectfully submitted,

GEORGE E. DAVENPORT,
For the Committee.

PRIZES AND GRATUITIES AWARDED FOR NATIVE PLANTS.

1899.

April 22.

Gratuity:—

Mrs. P. D. Richards 1 00

April 29.

Gratuity:—

Miss Alice L. Grinnell 2 00

May 6.

Native Plants.—Collection of thirty bottles of named species and varieties, one bottle of each:

First, Mrs. P. D. Richards 8 00
Second, Miss Alice L. Grinnell 6 00
Third, Misses Eleanor A. and Mollie S. Doran 4 00

May 13.

Gratuity:—

Mrs. P. D. Richards 2 00

May 20.

Gratuities:—

Mrs. P. D. Richards 1 00
Misses Eleanor and Mollie Doran 1 00

May 27.

Gratuity:—

Mrs. P. D. Richards 1 00

June 7 and 8 (*postponed dates*).

Native Plants.—Collection of thirty bottles of named species and varieties, one bottle of each:

First, Miss Alice L. Grinnell 8 00
Second, Mrs. P. D. Richards 6 00
Third, Misses Eleanor and Mollie Doran 4 00

June 10.

Gratuity:—

Miss Edith Noyes 2 00

July 1.

Gratuities:—

Miss Alice L. Grinnell 2 00
Misses Eleanor and Mollie Doran 2 00

JULY 8.

NATIVE PLANTS.—Collection not exceeding forty bottles of named species and varieties, one bottle of each:

First, Miss Alice L. Grinnell	8 00
Second, Mrs. W. S. Eager	6 00
Third, Miss Edith Noyes	4 00

JULY 15.

HARDY FERNS.—Collection of named species and varieties:

First, C. C. Kingman	6 00
Second, Miss Alice L. Grinnell	5 00
Third, Misses Eleanor and Mollie Doran	4 00

CULTIVATED NATIVE PLANTS.—Collection of species and varieties not common to cultivation:

First, Miss Edith Noyes	3 00

Gratuities:—

Miss Alice L. Grinnell	2 00
Miss Genevieve Doran	1 00

JULY 22.

Gratuities:—

Miss Edith Noyes	1 00
Miss Genevieve Doran	1 00
Miss Alice L. Grinnell	1 00
Misses Eleanor and Mollie Doran	1 00

JULY 29.

NATIVE PLANTS.—Collection, not exceeding forty bottles of named species and varieties, one bottle of each:

First, Miss Alice L. Grinnell	8 00
Second, Miss Edith Noyes	6 00
Third, Mrs. W. S. Eager	4 00

AUGUST 5.

Gratuity:—

Miss Alice L. Grinnell	2 00

AUGUST 12.

CULTIVATED NATIVE PLANTS.—Collection of species and varieties not common to cultivation:

First, Miss Edith Noyes	3 00

Gratuities:—

Misses Eleanor and Mollie Doran	3 00
Miss R. L. Mann	1 00

AUGUST 19.

Gratuities:—

Misses Eleanor and Mollie Doran	3 00
Miss Alice L. Grinnell	3 00
Miss R. L. Mann	1 00

AUGUST 26.

Gratuity:—

Miss Alice L. Grinnell	2 00

AUGUST 30 AND 31.

NATIVE PLANTS.—Collection, not exceeding forty bottles of named species and varieties, one bottle of each:

Misses Eleanor and Mollie Doran	8 00
Miss Alice L. Grinnell	6 00
Miss R. L. Mann	4 00

Gratuity:—

Walter E. Coburn, Special Collection of Native Grasses	3 00

SEPTEMBER 9.

Gratuities:—

Misses Eleanor and Mollie Doran	4 00
Miss Alice L. Grinnell	2 00
Miss R. L. Mann	1 00

SEPTEMBER 23.

Gratuities:—

Miss Alice L. Grinnell	2 00
Misses Eleanor and Mollie Doran	1 00

NOVEMBER 7.

Gratuity:—

Misses Eleanor and Mollie Doran	2 00

APPLETON SILVER MEDAL.

Miss Alice L. Grinnell, she having taken three first prizes for Native Plants.

APPLETON BRONZE MEDAL.

Miss Edith Noyes, she having taken two first prizes for Cultivated Native Plants.

HONORABLE MENTION.

Robert Manning, for a series of exhibits of Cultivated Native Plants.

REPORT

OF THE

Committee on Forestry and Roadside Improvement,

FOR THE YEAR 1899.

By HARVEY N. SHEPARD, CHAIRMAN.

The Committee on Forestry and Roadside Improvement respectfully reports that it has been engaged during the preceding year upon two branches of the work committed to its charge; one, a compilation of the statutes of the Commonwealth relative to trees, which is nearly complete and ready for publication, if the Society shall so authorize; and second, a thorough investigation regarding street or roadside trees in every part of the state, especially what kinds are most frequent; what kinds do best; which, if any, have generally failed; what noteworthy examples of individual trees are on record; whether the value of property abutting on the road has been increased by the planting, or decreased by the felling, of trees along the roadside; whether Arbor Day is observed; whether school children are interested in roadside improvement; in what conditions of soil, moisture, and exposure, trees grow best; what is the effect upon them of electric wires, pipes, lights, and pavements; to what extent roadside trees are placarded with advertisements; from what diseases or pests they suffer; to what extent tree guards are used, and what are the existing by-laws of the town relative to roadside trees.

To obtain this information about four thousand copies of a circular were distributed in the early summer to the Mayors of cities, the Selectmen of towns, the principals of high schools, the members of this Society, the members of the Forestry Association,

the members of the Appalachian Mountain Club, the officers of Agricultural and Horticultural Societies and Farmers' Clubs, and many more to individuals likely to be interested. Replies began to come in almost at once, and though the circular set October first as the time when, if possible, they were all to be in they are still arriving.

Replies have been received from one hundred and twenty-five cities and towns well distributed over the state; and the number, source, and character of these replies is such as to indicate a widespread and strong interest in our roadside trees. Not only has the circular given us much desired information but it has brought us into sympathetic touch with men and women throughout the Commonwealth who are interested in roadside improvement and who anxiously await the help which we should be able to give. This Society can well organize and wisely direct a great share of this now fast-growing interest and enthusiasm. Mr. James Sturgis Pray, the member of our Committee who has undertaken most of the labor in this branch of our work, and to whom the credit for the result is altogether due, has given a good deal of time, not only in the matter of the circular, but in a personal investigation, having made a reconnoissance from Cambridge to Greenfield, down the Connecticut Valley to Long Meadow, thence to Westfield, and both north and south from Pittsfield.

The Committee regrets that it has not so far finished its work as to be able to make a complete report to the Society, but it believes that in the early part of the coming year it will be ready to submit an interesting and useful pamphlet containing a compilation of the statutes, and also a collation from the information already obtained and still coming relative to roadside trees. For this work we respectfully request that an appropriation may be given to us in the sum of three hundred dollars.

For the Committee,

HARVEY N. SHEPARD,
Chairman.

REPORT

OF THE

COMMITTEE OF ARRANGEMENTS,

FOR THE YEAR 1899.

By JOSEPH H. WOODFORD, CHAIRMAN.

The Schedule List of Exhibitions during the past year called for about the same number as in former years, and they all have been very fully attended.

At only two of these shows has any admittance fee been asked, and we are glad to observe the amount received for admissions shows quite an increase over last year. The receipts for the two shows, according to the Treasurer's books will be found at the end of this report.

We are glad to know that the reporters of the daily press have been on the alert all through the season, and that our shows have been so faithfully and fully reported.

The arrangements of the shows have been as varied as possible in the limited space at our command, yet as a general thing they have met the approval of the public and the exhibitors.

We are glad to chronicle the unflagging interest which the gardeners manifest in the exhibitions, not only by contributing to their success but also in profiting by the success of their competitors. Their exhibitions are truly educators to all who take any interest in the growing of anything pertaining to horticulture.

The amount of money placed to the credit of this Committee has nearly all been expended, and for the benefit of the Society. We are now looking with pleasant anticipations to the (we hope) near future when we shall be domiciled in a new and commodious

hall where sufficient space on the ground floor will be provided not only for our exhibitions but for the comfort and convenience of our members and patrons.

The receipts for the Spring Show were . . .	$145 75
The receipts for the Chrysanthemum Show were .	945 50
Total	$1,091 25

All of which is respectfully submitted,

Jos. H. Woodford,

Chairman.

REPORT

TO THE

STATE BOARD OF AGRICULTURE,

FOR THE YEAR 1899.

On March of this year the Massachusetts Horticultural Society had the seventieth anniversary of its organization and found itself in a most flourishing condition.

The Annual Spring Exhibition was held March 21–24, inclusive, at which were shown cinerarias in large quantities, roses, and a very beautiful orchid for the first time on exhibition. There was a specially fine exhibition of carnations, violets, apples, pears, strawberries, and vegetables in the Lower Hall.

On the 8th of May the Society held a fine exhibition of plants, flowers, and vegetables.

June 1 and 2, the Society held a Rhododendron Show, which was a very excellent exhibition, every available space being occupied by these beautiful flowers. In the Lower Hall were exhibited fine specimens of fruits, flowers, and vegetables. This exhibition was exceedingly good considering the dryness of the season.

June 22 and 23 was held the Rose and Strawberry Exhibition. The finest collection of strawberries was one of seventy-five baskets containing from one to three quarts each. Hothouse grapes, cut flowers, and vegetables were also shown.

August 30 and 31 was held the Annual Plant and Flower Show, which, the officers of the Society say, was the best ever made. A large variety of plants, flowers, grapes, and other fruit and vegetables were shown.

September 28 and 29 was held the Annual Fruit and Vegetable Exhibition. Splendid specimens of all kinds of autumn agricultural products filled both halls and in addition, the exhibition of dahlias by itself was well worth seeing. Some of the pumpkins and squashes were extremely large, one of the former weighing seventy-seven pounds.

November 7–10, inclusive, the Society held a Chrysanthemum Exhibition which was larger than usual owing to the exhibition of many new varieties. In the upper hall the potted plants were arranged with great care, and displayed their flowers to the best advantage, and were excellent examples of the gardener's skill.

April 22 the Society held a meeting and authorized a committee to purchase a lot of land on the corner of Massachusetts and Huntington Avenues, comprising 22,500 square feet, and authorized the Finance Committee to sell or improve the Society's real estate on Tremont Street as the Committee shall deem for the best interest of the Society. The President was authorized to appoint a committee of five members, of which he should be chairman, with full powers to erect a building on the corner of Massachusetts and Huntington Avenues, for use of the Society at a cost not exceeding $225,000. A new building is very much needed by the Society where they can have more room and better ventilation for keeping plants than in their present one.

I would suggest that the Society appoint one committee whose duty it shall be to appoint all sub-committees; also that the Society hold fewer Saturday exhibitions, which are not generally patronized except by a few exhibitors, in this manner saving some of their money to make larger premiums at their annual exhibitions. At the present time, with the requirement that all exhibits shall be kept fresh, the exhibitor winning a first prize does not receive enough money to pay for the original exhibition, to say nothing of the expense of keeping it fresh. I think by giving fewer and larger prizes their money would be more widely distributed through the State than it is today.

N. I. Bowditch,

Inspector.

REPORT

OF THE

Committee on Lectures and Publication,

FOR THE YEAR 1899.

The Committee on Lectures and Publication beg leave to submit the following report:

During the lecture season they secured the following course of lectures which they believe will compare favorably with those of any previous season:

January 14. "Ancient and Modern Theories of Disease, with Special Reference to Diseases of Plants caused by Parasitic Fungi," by William T. Sedgwick, Professor of Biology, Massachusetts Institute of Technology, Boston. This lecture was delivered on the John Lewis Russell foundation.

January 21. "Experimental Work in Field and Garden," by Aaron Low, Hingham.

January 28. "Peach Culture," by J. H. Hale, South Glastonbury, Conn.

February 11. "Injurious Insects and their Transformations," by Professor Clarence M. Weed, New Hampshire College Agricultural Experiment Station, Durham, N. H.

February 18. "Why Crops must have Nitrogen and How it can be Provided," by Professor G. C. Caldwell, Cornell University, Ithaca, N. Y. With stereopticon illustrations.

February 25. "The Agriculture of Ancient Times compared with Massachusetts Agriculture," by Hon. William R. Sessions, Secretary of the Massachusetts State Board of Agriculture, Springfield.

March 4. "Questions Answered and Unanswered; the Season of 1898 along Horticultural Lines," by Walter F. Taber, Poughkeepsie, N. Y.

March 11. "Market Gardening," by Herbert W. Collingwood, New York, N. Y.

March 18. "Horticulture in Japan," by John K. M. L. Farquhar, Boston. With stereopticon illustrations.

March 25. "Roadside Treatment; Actual and Possible," by Mrs. F. H. Tucker, Newton.

During the year four parts of the TRANSACTIONS have been published, viz. Parts I and II, 1898; Part I, 1899, and Part III, 1896. The Schedule for the year has also been published, besides several minor publications.

Your Committee would suggest to the chairman of each committee of the Society that it is very desirable that their reports should be made ready as soon as possible after the duties of the current year have ceased, and be handed in to the Secretary in order that the yearly TRANSACTIONS shall be made ready and printed as soon as possible.

All which is respectfully submitted,

AARON LOW,
Chairman.

REPORT

OF THE

COMMITTEE ON THE LIBRARY,

FOR THE YEAR 1899.

As usual the report of this Committee will be brief, for the Librarian includes in his report such items of interest as there may have been in connection with the Library during the year. We have not had the Stickney Fund to draw upon, our enjoyment of the donor's generosity having lapsed by the expiration of the term for which he desired that we should have the use of it.

So well did he calculate that the fund has enabled us to procure nearly all of the really extensive and costly works now existing on the subjects to which this Library is devoted.

We asked for and received an appropriation of one thousand dollars at the beginning of the year, and that sum, one hundred dollars less than we have previously had, proved sufficient. We shall ask for the same amount for the year 1900, but, so complete has the library become, it is probable that the time is not far distant when a smaller sum will suffice.

The various departments of the Library work have made satisfactory progress; the card catalogue of accessions has been kept up and much work has been done on the catalogue of plates. We hope that the beginning of a similar catalogue of subjects may be not very far away.

For the Committee,

W. E. ENDICOTT,

Chairman.

REPORT

OF THE

SECRETARY AND LIBRARIAN,

FOR THE YEAR 1899.

Since a copy has been sent to every member of the Society it seems hardly necessary to say that the first part of the TRANSACTIONS for 1899 was ready, if not as early as if no hindrance had been placed in the way by the failure of one of the lecturers to return his paper, which he had taken home for revision, yet with a reasonable degree of promptness. This paper, I may add, was never returned, and the Committee on Publication were obliged to content themselves with the publication of the abstract printed in the *Transcript* at the time of its delivery. It is to be hoped that no such hindrance will again occur, but it is impossible, when a lecturer desires to take his paper home for revision before final publication, to refuse, and it seems equally impossible to make lecturers sensible of the absolute necessity of a prompt return if the publication of the TRANSACTIONS is not to be delayed, and a chairman of a committee or a lecturer has it just as much in his power as ever to delay publication by negligence in making his report or in returning his paper with revisions.

The two parts preceding that above mentioned, viz, the first and second parts for 1898, have also been published during the year, and also the third part for 1896, being the List of Library Accessions during the year, so that we are in a hopeful way to bring up all arrears. There still remain the third parts for 1897 and 1898, and it was hoped to print the first of these during the present year, but it was ultimately found impossible to do this consistently with justice to other work, but Part III for 1897 is now in an advanced state of preparation. As these third parts form an annual supplement to the Library Catalogue no pains are spared to have them ready at the earliest possible moment, consistent with fulness and accuracy.

During the present and the preceding year the number of Special Meetings for the transaction of important business relating to the Hayes estate, and the purchase of land and the erection of a building for the better accommodation of the Society, has probably been greater than in all the previous history of the Society, and has added materially to the work in the Secretary's department. The number of members added to the Society during the past year has been greater than for many years previous, with the like result of increased work for the Secretary and his assistants.

One of the conditions of the Stickney Fund was that the income of $700 should be expended for *books* in each and every year, but now that the Society's interest in that fund has expired, it was deemed best, in the present crowded state of the Library Room, not to purchase so many books as heretofore, at the same time not neglecting any opportunity to secure a rare and desirable book or to complete a set, or any valuable current publication. The Committee therefore asked for $1,000, $100 less than the total of the income of the Stickney Fund and the Society's appropriation of $400 for periodicals, binding, etc., and it was purposed that the purchase of books be further reduced by employing a larger amount than heretofore in binding such books already in the library as needed it. This purpose has been carried out as far as possible, but owing to the time necessarily given to the TRANSACTIONS it has been impossible to devote as much as we should have liked to give, to the preparation of books for the binder or to the Card Catalogue of Plates.

When the present gallery in the Library Room was built in 1889 the Library Committee was desirous of having it extended around the smaller room, and also to have a stack room on the level of the gallery, built as a half story in the staircase hall. In December, 1893, the subject of extending the gallery around the smaller room was again brought up, and on both these occasions plans and estimates for the necessary alterations in the building and the construction of bookcases for the new gallery and stack room were procured. The present year the President, in his annual address suggested that such alterations might relieve the very congested condition of our books, and asked that the Library Committee give the matter consideration again, which was accordingly done. This was before it was decided whether the Society should

remain in the building and endeavor to adapt it to its enlarged work or erect a new building, and it was felt that if we remained in this building the place above mentioned would be the best and indeed the only way of gaining additional accommodations for the Library. Plans and estimates were therefore more carefully considered than ever before at the expense of much thought and time.

The present year is memorable for the completion of Sargent's "Silva of North America" as originally planned, though a supplementary volume is promised. This is beyond comparison the most magnificent botanical work ever published in this country. Mouillefert's "Arbres et Arbrisseaux" has also been completed. Other noticeable books are "An Old English Garden" by the Countess of Warwick; Haité's "Plant Studies," and Davis's "Ornamental Shrubs," the last supplying more fully than before, information on its subject which has long been wanted. Simon and Cochet's "Names of Roses" is a valuable book of reference. King's Photographs of American Parks form a valuable continuation of his similar collection of English photographs, and is to be followed by more views in this country and also in Europe. The new American edition of Burberry's "Amateur Orchid Cultivator" edited by Dr. J. M. Kitchen is a valuable handbook of that family of plants. Books of the character of "Lamia's Winter Quarters," by Alfred Austin; Mrs. Earle's "Potpourri from a Surrey Garden;" Miss Jekyll's "Wood and Garden," etc., dealing with the literature and amenities of horticulture, more than with practical instructions have been thought desirable as calculated to increase the taste for rural life, and have accordingly been added. Another class of books, which has grown up in the last few years, represented by Maud Going's "Field, Forest, and Wayside Flowers," F. Schuyler Mathews's "Familiar Features of the Roadside," Mrs. Frances Theodora Parson's "How to Know the Ferns," etc, is an attempt to enable persons to become acquainted with the names and affinities of plants, who lack either the time or the disposition to make a systematic study of botany. Judging from the circulation of these books and the reports of those who have read them, the efforts of their authors have met with a considerable degree of success.

ROBERT MANNING,
Secretary and Librarian.

TREASURER'S REPORT.

FOR THE YEAR 1899.

MASSACHUSETTS HORTICULTURAL SOCIETY, *in account current with* CHARLES E. RICHARDSON, *December 30th, 1899.*

DR.

To amount paid on account of Library in 1899:		
Appropriated by the Society	$1,000 00	
Balance of Josiah Stickney Fund . . .	1 00	
		$1,001 00
To amount paid Interest on Funds for Prizes, credited opposite		1,742 72
" " Interest paid on Mortgage . .	3,937 50	
" " " " " Loan . . .	198 90	
		4,136 40
" " paid on Prizes awarded in 1898, viz.:		
" " " Plants	1,727 50	
" " " Flowers	2,042 75	
" " " Fruit	1,666 00	
" " " Vegetables	1,147 00	
" " " Gardens and Greenhouses . .	580 00	
" " " H. H. Hunnewell Prizes for Rhododendrons	105 00	
" " " H. H. Hunnewell Triennial Prizes	160 00	
		$7,428 25
" " " Lot on Massachusetts and Huntington Avenues		225,000 00
" " " Harvard College		12,000 00
" " " H. H. Hunnewell account of old mortgage .		1,000 00
" " " Salaries of Treasurer, Secretary and Assistants		4,300 00
" " " " " " Committees		1,218 00
" " " City Taxes		4,466 96
" " " Legal Services		926 25
" " " Incidentals		1,031 03
" " " H. S. Adams		4 00
" " " Committee of Arrangements		395 55
" " " Committee on School Gardens and Children's Herbariums		50 40
Amount carried forward		$264,700 56

Amount brought forward	$264,700 56
To amount paid Insurance	634 32
" " " Repairs	89 67
" " " Exhibition Ware	54 60
" " " Heating	897 24
" " " Lighting	771 69
" " " Water Rates	225 98
" " " Lectures	281 31
" " " Labor	2,345 37
" " " Stationery, Printing, and Postage	2,630 78
" " " on account Real Estate in South Boston	168 99
" " " Committee on Forestry and Roadside Improvement	106 29
" " " on account Building on Massachusetts and Huntington Avenues	5,387 25
	$278,294 05
Balance of Cash December 30, 1899	23,920 27
	$302,214 32

Cr.

By Balance of account rendered December 31, 1898			$14,105 60
Received from Building in 1899, viz.:			
Rents of Stores	$17,506 15		
" " Halls	1,315 00		
		$18,821 15	
Received Income from Mt. Auburn Cemetery		5,117 66	
" State Bounty		600 00	
" Admissions and Assessments		4,852 00	
" Annual Exhibitions	$1,091 25		
Less Expenses	331 24		
		760 01	
" Interest on Bonds	6,445 00		
" " " Deposit in Bank	178 74		
		6,623 74	
" Bequest of Francis B. Hayes on account		15,744 24	
" on account on Mortgage		225,000 00	
" from A. P. Loring, Executor		7,500 00	
" " H. H. Hunnewell, Prize Money, 1898		47 00	
" " Sale of Transactions		10 00	
" " Sale of Copies of History		5 00	
" H. E. Woodward in Settlement of Old Debt		835 08	
" Bills Receivable		450 12	
Amounts carried forward		$286,366 00	$14,105 60

Amounts brought forward		$286,366 00	$14,105 60
Received Interest credited the following Funds charged opposite,:			
Samuel Appleton Fund .	$50 00		
John A. Lowell " .	50 00		
Theodore Lyman " .	550 00		
Josiah Bradlee " .	50 00		
Benjamin V. French " .	25 00		
W. J. Walker " .	117 72		
Levi Whitcomb " .	25 00		
Benjamin B. Davis " .	25 00		
Marshall P. Wilder " .	50 00		
John Lewis Russell " .	50 00		
H. H. Hunnewell " .	200 00		
Francis Brown Hayes " .	500 00		
Henry A. Gane Memorial Fund,	50 00		
		1,742 72	
			288,108 72
			$302,214 32

(Signed) CHARLES E. RICHARDSON,
Treasurer.

Approved:

H. H. HUNNEWELL,
AUGUSTUS HEMENWAY,
FRANCIS H. APPLETON,
Finance Committee.

ASSETS AND LIABILITIES OF THE MASSACHUSETTS HORTICULTURAL SOCIETY.

DECEMBER 30, 1899.

ASSETS.

Real Estate	$475,000 00	
Stereotype Plates and Copies of History	246 50	
Lake Shore & Michigan So. R. R. Bonds	10,415 25	
City of Newton Bonds	24,228 75	
Chicago, Burlington & Quincy R.R. Bonds	1,000 00	
Atchinson, Topeka & Santa Fé R.R. Bonds	44,693 25	
Chicago, Burlington & Quincy, Nebraska Extension, R.R. Bonds	50,012 50	
Kansas City, Clinton & Springfield R. R. Bonds	1,980 00	
Sinking Fund	23,872 50	
Furniture and Exhibition Ware	7,729 50	
Library	39,112 47	
Bills Receivable	624 05	
Cash on hand and in Bank	23,920 27	
		$702,835 04

LIABILITIES.

Mortgage		$225,000 00	
Prize Funds invested in Building, viz.:			
Samuel Appleton Fund,	$1,000 00		
John A. Lowell "	1,000 00		
Theodore Lyman "	11,000 00		
Josiah Bradlee "	1,000 00		
Benjamin V. French "	500 00		
H. H. Hunnewell "	3,000 00		
W. J. Walker "	2,354 43		
Levi Whitcomb "	500 00		
Benjamin B. Davis "	500 00		
Francis Brown Hayes "	10,000 00		
Henry A. Gane Memorial "	1,000 00		
		$31,854 43	
Amounts carried forward		$31,854 43	$225,000 00

Amounts brought forward		$31,854 43	$225,000 00	
Prize Funds invested in Bonds:				
John Lewis Russell Fund	1,000 00			
Marshall P. Wilder "	1,000 00			
H. H. Hunnewell "	1,000 00			
		3,000 00		
			34,854 43	
Prizes for 1899 payable in 1900			8,349 60	
				$268,204 03
Surplus				434,631 01
				$702,835 04

CHAS. E. RICHARDSON,
Treasurer.

MEMBERSHIP ACCOUNT OF THE MASSACHUSETTS HORTICULTURAL SOCIETY, DECEMBER 30, 1899.

Life Members per last report	535		
Added in 1899	146		
Commuted from Annual	1		
		682	
Deceased		23	
			659
Annual Members per last report	203		
Added in 1899	7		
		210	
Resigned	1		
Commuted to Life	1		
Deceased	5		
Dropped for non-payment for two years	4		
		11	
			199
Present Membership			858

INCOME FROM MEMBERSHIP.

146 new Life Members @ $30	$4,380 00
1 Commuted to Life @ $20	20 00
7 new Annual Members @ $10	70 00
Annual Assessments	382 00
	$4,852 00

CHAS. E. RICHARDSON,
Treasurer.

Dr. *Massachusetts Horticultural Society in account with the Proprietors of Mount Auburn Cemetery.* **Cr.**

For Sales and Improvements within the Cemetery for the year ending December 31, 1899.

To cost of filling up and improving land at Mt. Auburn for the year ending Dec. 31, 1899. The Massachusetts Horticultural Society being charged with their proportion of the same:			By Sales in January		
Birch to Eagle and Cherry Avenues	$148 50		" " " February		295 00
Yew and Fountain Avenues	121 88		" " " March		180 00
Glen Avenue	500 06		" " " April		991 00
	$770 44		" " " May		3,758 00
			" " " June		1,458 25
			" " " July		780 00
			" " " August		2,418 00
			" " " September		1,440 00
			" " " October		4,571 00
			" " " November		4,036 85
			" " " December		1,440 00
					$21,368 10
One-fourth of $770.44 is	$192 61		Net amount received from Receiving Tomb		1,338 00
Balance due Mass. Horticultural Society,	5,117 66				$22,706 10
			Less graves repurchased		65 00
					$22,641 10
			Deduct for annual expenses		1,400 00
					$21,241 10
		$5,310 27	Mass. Horticultural Society, ¼ part of $21,241.10		$5,310 27

E. & O. E.

H. B. MACKINTOSH, *Treasurer.*

DECEMBER 31, 1899.

MASSACHUSETTS HORTICULTURAL SOCIETY

To the PROPRIETORS OF THE CEMETERY OF MOUNT AUBURN. *Dr.*

For *one-fourth part* of the following *expenditures for grading* new *lands for sale* during the year 1899:

Birch to Eagle and Cherry Avenues.

66 days, men		$148 50

Yew and Fountain Avenues.

32½ days, man and horse		121 88

Glen Avenue.

38 days, men	$85 50	
64½ days, horses	96 75	
84¾ days, man and horse	317 81	
		500 06
		$770 44
One-fourth of $770.44 is		$192 61

JAMES C. SCORGIE,

Supt. of the Cemetery of Mount Auburn.

MOUNT AUBURN, December 31, 1899.

I certify the foregoing to be a true copy of improvements for the year 1899, rendered by the Superintendent.

H. B. MACKINTOSH,

Treasurer.

Massachusetts Horticultural Society.

OFFICERS AND STANDING COMMITTEES FOR 1900.

President.

FRANCIS H. APPLETON.

Vice-Presidents.

CHARLES H. B. BRECK, OF BRIGHTON. BENJAMIN P. WARE, OF CLIFTON.
WALTER HUNNEWELL, OF WELLESLEY. SAMUEL HARTWELL, OF LINCOLN.

Treasurer and Superintendent of the Building.

CHARLES E. RICHARDSON, OF CAMBRIDGE.

Secretary and Librarian.

ROBERT MANNING, OF SALEM.[1]

Professor of Botany and Vegetable Physiology.

BENJAMIN M. WATSON, OF JAMAICA PLAIN.

Professor of Entomology.

SAMUEL H. SCUDDER, OF CAMBRIDGE.

Delegate to the State Board of Agriculture.

WILLIAM H. SPOONER, OF JAMAICA PLAIN.

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1 Communications to the Secretary, on the business of the Society, should be addressed to him at Horticultural Hall, 101 Tremont street, Boston.

STANDING COMMITTEES.

Executive.

THE PRESIDENT, FRANCIS H. APPLETON, CHAIRMAN.
THE CHAIRMAN OF THE FINANCE COMMITTEE, H. H. HUNNEWELL, *Ex-officio.*

WILLIAM C. STRONG. BENJAMIN C. CLARK.
WILLIAM H. SPOONER. WALTER HUNNEWELL.
NATHANIEL T. KIDDER. CHARLES W. PARKER.
CHARLES F. CURTIS.

Finance.

H. HOLLIS HUNNEWELL, OF BOSTON, CHAIRMAN.
FRANCIS H. APPLETON. AUGUSTUS HEMENWAY.

Lectures and Publication.

AARON LOW, OF HINGHAM, CHAIRMAN.
JAMES H. BOWDITCH. E. W. WOOD.

Library.

WILLIAM E. ENDICOTT, OF CANTON, CHAIRMAN.
GEORGE W. HUMPHREY. GEORGE E. DAVENPORT.
WALTER S. PARKER. CHARLES W. SWAN.

Plants.

WILLIAM WALLACE LUNT, OF HINGHAM, CHAIRMAN.
JAMES WHEELER. ARTHUR H. FEWKES.
WILLIAM J. MARTIN. ROBERT CAMERON.

Flowers.

J. WOODWARD MANNING, OF READING, CHAIRMAN.
MICHAEL H. NORTON. FREDERICK S. DAVIS.
KENNETH FINLAYSON. JAMES COMLEY.

Fruits.

E. W. WOOD, OF WEST NEWTON, CHAIRMAN.
CHARLES F. CURTIS. WARREN FENNO. J. WILLARD HILL.
O. B. HADWEN. SAMUEL HARTWELL. SUMNER COOLIDGE.

Vegetables.

WARREN H. HEUSTIS, OF BELMONT, CHAIRMAN.
CEPHAS H. BRACKETT. WALTER RUSSELL. GEORGE D. MOORE.
VARNUM FROST. AARON LOW. JOSHUA C. STONE.

Forestry and Roadside Improvement.

HARVEY N. SHEPARD, CHAIRMAN.
NATHANIEL S. SHALER. J. WOODWARD MANNING.
J. D. W. FRENCH. JAMES STURGIS PRAY, SECRETARY.

Gardens.

PATRICK NORTON, of Dorchester, Chairman.
CHAIRMEN OF THE COMMITTEES ON PLANTS, FLOWERS, FRUITS, VEGETABLES, AND ARRANGEMENTS, *Ex-officiis*.
HENRY W. WILSON. JACKSON T. DAWSON.

For Establishing Prizes.

WILLIAM J. STEWART, of Winchester, Chairman.
CHAIRMEN OF THE COMMITTEES ON PLANTS, FLOWERS, FRUITS, VEGETABLES, AND GARDENS, *Ex-officiis*.
WILLIAM J. MARTIN.

Committee of Arrangements.

JOSEPH H. WOODFORD, of Boston, Chairman.
CHAIRMEN OF THE COMMITTEES ON PLANTS, FLOWERS, FRUITS, VEGETABLES, AND GARDENS, *Ex-officiis*.
ROBERT FARQUHAR.

MEMBERS FOR LIFE.

Members of the Society and all other persons who may know of deaths, changes in residence, or other circumstances showing that the following list is incorrect in any particular, will confer a favor by promptly communicating to the Secretary any needed corrections.

Information, or any clew to it, is especially desired in regard to members whose names are marked thus.†

Adams, Mrs. Charles Francis, South Lincoln.
Adams, Henry Saxton, Dorchester.
Adams, Luther, Newton.
Alger, Rev. R. F., Becket.
Allen, Hon. Charles H., Lowell.
Allen, Thomas, Boston.
Ames, F. Lothrop, North Easton.
Ames, Mrs. F. L., North Easton.
Ames, George, Boston.
Ames, John S., North Easton.
Ames, Miss Mary S., North Easton.
Ames, Oakes, 2d, North Easton.
Ames, Oliver, North Easton.
Ames, Preston Adams, Boston.
Amory, C. W., Boston.
Amory, Frederick, Boston.
Anderson, Larz, Brookline.
Andrews, Charles L., Milton.
Andrews, Frank W., Washington, D. C.
Andros, Milton, San Francisco, Cal.
Appleton, Francis H., Boston.
Appleton, William S., Boston
Ash, John, Pomfret Centre, Conn.
Asmus, Ernst G., West Hoboken, N. J.
Atkins, Edwin F., Belmont.
Ayer, James B., Boston.
Bailey, Jason S., West Roxbury.
Ball, George H., Boston.
Bancroft, John C., Boston.
Banfield, Francis L., M.D., Worcester.
Barber, J. Wesley, Newton.
Barnard, James M., Boston.
Barnard, Robert M., Everett.
Barnes, Walter S., Somerville.
†Barney, Levi C., Boston.
Barry, John Marshall, Boston.
Barry, William C., Rochester, N. Y.
Bartlett, Edmund, Newburyport.
Bartlett, Francis, Beverly.
Baylies, Walter C., Taunton.
Beal, Leander, Swampscott
Becker, Frederick C., Cambridge.
Beckford, Daniel R., Jr., Dedham.
Beebe, E. Pierson, Boston.
Beebe, Franklin H., Boston.
Beebe, J. Arthur, Boston.
Bigelow, Albert S., Cohasset.
Bigelow, Joseph S., Cohasset.
Bigelow, Dr. William Sturgis, Boston.
Black, George N., Manchester.
Blake, Miss Anne, Brookline.
Blake, Mrs. Arthur W., Brookline.
Blake, Edward D., Boston.

Blake, Francis, Weston.
Blake, Frederick A., Rochdale.
Blakemore, John E., Roslindale.
Blanchard, John W., West Newton.
Blinn, Richard D., Chicago, Ill.
Bliss, William, Boston.
Boardman, Samuel M., Hyde Park.
Boardman, T. Dennie, Manchester.
Bôcher, Prof. Ferdinand, Cambridge.
Bockus, Charles E., Dorchester.
Bosler, Frank C., Carlisle, Penn.
Bowditch, Charles P., Jamaica Plain.
Bowditch, Ernest W., Milton.
Bowditch, James H., Brookline.
Bowditch, Nathaniel I., Framingham.
Bowditch, William E., Roxbury.
Bowker, William H., Boston.
Brackett, Cephas H., Newton.
Bremer, Mrs. John L., Manchester.
Bresee, Albert, Hubbardton, Vt.
Brewer, Francis W., Hingham.
Briggs, William S., Lincoln.
Brigham, William T., Honolulu, Hawaii.
Brooks, J. Henry, Milton.
Brooks, Lawrence, Groton.
Brooks, Peter C., Boston.
Brooks, Shepherd, Boston.
Brown, Charles E., Yarmouth, N. S.
Brown, Edward J., Weston.
Brown, George Barnard, Brookline.
Brown, John M., Belmont.
Brown, John T., Newburyport.
Brown, Samuel N., Boston.
Bullard, John R., Dedham
Burlen, William H., Boston.
Burnett, Harry, Southborough.
Burnham, John A., Manchester.
Burr, Matthew H., Hingham.
Buswell, Frank E., Brooklyn, N. Y.
Butler, Aaron, Wakefield.
Butler, Edward K., Jamaica Plain.

Cabot, Dr. Arthur T., Boston.
Cabot, Edward C., Brookline.
† Cadness, John, Flushing, N. Y.
Cains, William, South Boston.
Calder, Augustus P., Boston.
Cameron, Robert, Cambridge.
Campbell, Francis, Cambridge.
Capen, John, Boston.
Carlton, Samuel A., Boston.
Carr, Hon. John, Roxbury.
Carter, Charles N., Boston.
Carter, Miss Maria E., Woburn.
Cartwright, George, Dedham.
Casas, W. B. de las, Malden.
Chadbourne, Marshall W., East Watertown.
Chaffin, John C., Newton.
Chamberlain, Chauncy W., Brookline.
Chase, Andrew J., Lynn.
Chase, Daniel E., Somerville.
Chase, George B., Dedham.
Chase, William M., Dorchester.
Cheney, Amos P., Natick.
Cheney, Mrs. Elizabeth S., Wellesley.
Childs, Nathaniel R., Boston.
Choate, Charles F., Southborough.
Christie, William, Newton.
Claflin, Hon. William, Boston.
Clapp, Edward B., Dorchester.
Clapp, James H., Dorchester.
Clapp, William C., Dorchester.
Clark, Benjamin C., Boston.
Clark, B. Preston, Cohasset.
Clark, Miss Eleanor J., Pomfret Centre, Conn.
Clark, J. Warren, Rockville.
Clarke, Miss Cora H., Boston.
Clarke, Eliot C., Boston.
Cleary, Lawrence, Roxbury.
Clough, Micajah Pratt, Lynn.
Cobb, Albert A., Brookline.
Cobb, John C., Milton.
Coburn, Isaac E., Everett.
Codman, James M., Brookline.
Codman, Ogden, South Lincoln.
Collamore, Miss Helen, Boston.
Converse, Elisha S., Malden.

Converse, Col. H. E., Malden.
Coolidge, Joshua, Mount Auburn.
Coolidge, J. Randolph, Chestnut Hill.
Coolidge, Mrs. J. Randolph, Chestnut Hill.
Coolidge, T. Jefferson, Jr., Boston.
Cottle, Henry C., Boston.
Cowing, Walter H., Brookline.
Cox, Thomas A., Dorchester.
Coy, Samuel I., Boston.
Crane, Zenas, Dalton.
Crawford, Dr. Sarah M., Roxbury.
Crocker, Hon. George G., Boston.
Crocker, Miss S. H., Boston.
Crosby, George E., West Medford.
† Crowell, Randall H., Chelsea.
Curtis, Charles F., Jamaica Plain.
Curtis, Charles P., Swampscott.
Curtis, Charles P., Jr., Boston.
Cushing, Livingston, Weston.
Cushing, Robert M., Boston.

† Daggett, Henry C., Boston.
Dalton, Charles H., Beverly.
Daly, John C., Roxbury.
Damon, Frederick W., Arlington.
Dana, Charles B., Wellesley.
Daniels, Dr. Edwin A., Boston.
Davenport, Albert M., East Watertown.
Davenport, Edward, Dorchester.
Davenport, George E., Medford.
Davis, Edward L., Worcester.
Davis, John, Lowell.
Davis, L. Shannon, Brookline.
Dawson, Jackson T., Jamaica Plain.
Dee, Thomas W., Cambridge.
Denny, Clarence H., Boston.
Denton, Eben, Dorchester.
Dewson, Francis A., Newtonville.
Dexter, F. Gordon, Boston.
Dexter, George, Beverly.
Dike, Charles C., Stoneham.
Doliber, Thomas, Brookline.
Donald, William, West Roxbury.
Dorr, George, Dorchester.
Dove, George W. W., Andover.
Dowse, William B. H., West Newton.
Draper, Hon. Eben S., Hopedale.
Draper, George A., Hopedale.
Dreer, William F., Philadelphia, Pa.
Dumaresq, Herbert, Chestnut Hill.
Duncan, James L., Chelsea.
Dunlap, James H., Nashua, N. H.
Durant, William, Boston.
Durfee, George B., Fall River.
Dutcher, Frank J., Hopedale.

Eaton, Horace, Cambridge.
Edgar, William W., Waverly.
Eldredge, H. Fisher, Boston.
† Eldridge, E. H., Roxbury.
Ellicott, Joseph P., Boston.
Elliot, Mrs. John W., Boston.
Elliott, William H., Brighton.
Endicott, William, Boston.
Endicott, William, Jr., Boston.
Endicott, William C., Jr., Danvers.
Endicott, William E., Canton.
Estabrook, Arthur F., Boston.
Ewell, Warren, Dorchester.

Fairchild, Charles, Boston.
Falconer, William, Pittsburgh, Pa.
Farlow, Lewis H., Newton.
Farnsworth, Mrs. William, Dedham.
Farquhar, James F. M., Roslindale.
Farquhar, John K. M. L., Roxbury.
Farquhar, Robert, North Cambridge.
Faxon, John, Quincy.
Fay, H. H., Wood's Holl.
Fay, Joseph S., Jr., Wood's Holl.
Fenno, L. Carteret, Boston.
Fessenden, George B., Allston.
Fewkes, Arthur H., Newton Highlands.
Finlayson, Kenneth, Brookline.
Fisher, James, Roxbury.
Flagg, Augustus, Boston.
Fletcher, George V., Belmont.
Fletcher, J. Henry, Belmont.
Fletcher, John W., Chelsea.

Flint, David B., Boston.
Foster, Charles H. W., Brookline.
Foster, Francis C., Cambridge.
Fottler, John, Jr., Dorchester.
Fowle, George W., Jamaica Plain.
Fowle, William B., Auburndale.
French, Miss Caroline L. W., Boston.
French, J. D. Williams, Boston.
French, Jonathan, Boston.
French, S. Waldo, Jamaica Plain.
French, W. Clifford, Cambridge.
Frohock, Roscoe R., Malden.

Galloupe, Charles W., Swampscott.
Galvin, John, Boston.
Gardner, George A., Boston.
Gardner, George P., Boston.
†Gardner, Henry N., Mount Auburn.
Gardner, John L., Boston.
Gardner, Mrs. John L., Brookline.
Gardner, William Amory, Groton.
Gaston, William A., Boston.
Gibbs, Wolcott, M.D., Newport, R.I.
Gill, George B., Medford.
Gillard, William, Dorchester.
Gilmore, E. W., North Easton.
Gilson, F. Howard, Wellesley Hills.
Glover, Joseph B., Boston.
Goddard, A. Warren, Brookline.
Goddard, Joseph, Sharon.
Goodell, L. W., Dwight.
Gorham, James L., Jamaica Plain.
†Gould, Samuel, Boston.
Gowing, Mrs. Clara E., Kendal Green.
Gray, James, Wellesley.
Gray, Mrs. John C., Boston.
Gregory, Hon James J. H., Marblehead.
Grew, Edward S., Boston.
Grey, Benjamin, Malden.
Guild, J. Anson, Brookline.

Hadwen, Obadiah B., Worcester.
Hale, James O., Byfield.
Hall, Edwin A., Cambridgeport.
Hall, George A., Chelsea.
Hall, George R., M.D., Warren, R.I.
Hall, Jackson E., Boston.
Hall, Osborn B., Malden.
Hall, William F., Brookline.
Halliday, William H., South Boston.
Hammond, Gardiner G., New London, Conn.
Hammond, George W., Boston.
†Harding, George W., Arlington.
Harding, Louis B., Stamford, Conn.
Hardy, F. D., Cambridgeport.
Harlow, James F., Quincy.
Harris, Charles, Cambridge.
Harris, Thaddeus William, A.M., Keene, N. H.
Hartshorn, Arthur E., Worcester.
Harwood, George Fred, Newton.
Haskell, Edwin B., Auburndale.
Haskell, John C., Lynn.
Hastings, Levi W., Brookline.
Hatch, Mrs. C. S., North Cambridge.
Hatch, Edward, Boston.
Hawken, Mrs. Thomas, Rockland, Me.
Hayward, George P., Roxbury.
†Hazeltine, Hazen, Boston.
Hemenway, Augustus, Canton.
Hemenway, Mrs. Augustus, Canton.
Henshaw, Joseph P. B., Boston.
Henshaw, Samuel, Cambridge.
Hewett, Miss Mary C., Canton.
Hews, Albert H., North Cambridge.
Hilbourn, A. J., Boston.
Hill, John, Stoneham.
Hittinger, Jacob, Mount Auburn.
Hoar, Samuel, Concord.
Hodgkins, John E., Portsmouth, N. H.
Hoitt, Hon. Charles W., Nashua, N. H.
Hollingsworth, Amor L., Milton.
Hollingsworth, Z. T., Boston.
Hollis, George W., Grantville.
Holmes, Edward Jackson, Boston.

Holt, Mrs. Stephen A., Winchester.
Hooper, William, Boston.
Horner, Mrs. Charlotte N.S., Georgetown.
Horsford, Miss Kate. Cambridge.
Hovey, Charles H., South Pasadena, Cal.
Hovey, Stillman S., Woburn.
Howard, Joseph W., Somerville.
Hubbard, Charles Wells, Weston.
Hubbard, James C., Everett.
Humphrey, George W., Dedham.
Hunnewell, Arthur, Wellesley.
Hunnewell, Henry Sargent, Wellesley.
Hunnewell, H. Hollis, Wellesley.
Hunnewell, Walter, Wellesley.
Hunt, Dudley F., Reading.
Hunt, Francis W., Melrose.
†Hunt, Franklin, Boston.
Hunt, William H., Concord.

Jack, John George, Jamaica Plain.
Jackson, Charles L., Cambridge.
Jackson, Robert T., Boston.
James, George Abbot, Nahant.
Janvrin, William S., Revere.
Jeffries, William A. Boston.
Jenks, Charles W., Bedford.
Johnson, J. Frank, Malden.
Jones, Jerome, Brookline.
Jones, Dr. Mary E., Boston.
Jordan, Eben D., Boston.
Jordan, Henry G., Hingham.
Jose, Edwin H., Cambridgeport.

Kakas, Edward, West Medford.
Kellen, William V., Marion.
Kelly, George B., Jamaica Plain.
Kendall, D. S., Woodstock, Ont.
Kendall, Edward, Cambridgeport.
†Kendall, Joseph R., San Francisco, Cal.
Kendall, Dr. Walter G., Atlantic.
Kendrick, Mrs. H. P., Allston.
Kennedy, George G., M.D., Roxbury.
Kent, John, Chestnut Hill.
†Keyes, E. W., Denver, Col.
Keyes, John M., Concord.
Kidder, Charles A., Southborough.
Kidder, Nathaniel T., Milton.
†Kimball, A. P., Boston.
Kimball, David P., Boston.
King, D. Webster, Boston
Kingman, Abner A., Brookline.
Kingman, C. D., Middleborough.
Knapp, Walter H., Newtonville.

Lamb, Horatio A., Milton.
Lancaster, Charles B., Boston.
Lanier, Charles, Lenox.
Lawrence, Amory A., Boston.
Lawrence, Amos A., Boston.
Lawrence, James, Groton.
Lawrence, John, Groton.
Lawrence, Rt. Rev. William, Boston.
Learned, Charles A., Arlington.
Lee, Daniel D., Jamaica Plain.
Lee, Francis H., Salem.
Lee, George C., Newton.
Leeson, Hon. Joseph R., Newton Centre.
Lemme, Frederick, Charlestown.
Leuchars, Robert B., Dorchester.
Lewis, Edwin C., Taunton.
Lewis, William G., Framingham.
Lincoln, George, Hingham.
Lincoln, Col. Solomon, Boston.
Little, James L., Brookline.
Little, John Mason, Swampscott.
Locke, Isaac H., Belmont.
Lockwood, Rhodes, Boston.
Lodge, Richard W., Boston.
Loftus, John P., Dorchester.
Loomis, Elihu G., Bedford.
Loring, Augustus P., Beverly.
Loring, Mrs. William Caleb, Beverly.
Lothrop, William S. H., Boston.
†Lowder, John, Watertown.
Lowell, Abbott Lawrence, Boston.

Lowell, Augustus, Boston.
Luke, Otis H., Brookline.
Lumb, William, Boston.
Lunt, William W., Hingham.
Lyman, George H., Wareham.
Lyman, Mrs. Theodore, Brookline.
Lyon, Henry, M. D., Charlestown.

Mabbett, George, Plymouth.
†Maboney, John, Boston.
Mallet, E. B., Jr., Freeport, Me.
Mann, James F., Ipswich.
Manning, Jacob W., Reading.
Manning, J. Woodward, Reading.
Manning, Mrs. Lydia B., Reading.
Manning, Robert, Salem.
Manning, Warren H., Brookline.
Marshall, Frederick F., Everett.
Marston, Howard, Boston.
Mason, Miss Ellen F., Boston.
Mason, Col. Frederick, Taunton.
Matthews, Nathan, Boston.
May, Frederick W. G., Boston.
McCarty, Timothy, Providence, R. I.
McWilliam, George, Whitinsville.
Melvin, James C., West Newton.
Merriam, Charles, Boston.
Merriam, Herbert, Weston.
Merrill, Hon. Moody, Roxbury.
Metivier, James, Cambridge.
Milmore, Mrs. Joseph, Washington, D. C.
Minot, Charles S., Milton.
Minton, James, Boston.
Mitton, Edward J., Brookline.
Mixter. George, Boston.
Monteith, David, Dedham
Montgomery, Alexander, Natick.
Moore, John H., Concord.
Morgan, George H., New York, N.Y.
Morse, John T., Jr., Boston.
Moseley, Charles H., Dorchester.
Mudge, George A., Portsmouth, N. H.
Murphy, William Bowen, Boston.
Mutch, John, Brookline.

Nevins, Mrs. David, Methuen.
Newman, John R , Winchester.
Newton, Rev. William W., Pittsfield.
Nickerson, George A., Dedham.
Nickerson, Mrs. George A., Dedham.
Norton, Charles W., Allston.
Norton, Edward E., Boston.

Oakman, Hiram A., North Marshfield.
Olmsted, Frederick Law, Jr., Brookline.
Olmsted, John C., Brookline.
Orpet, Edward O., South Lancaster.

Packer, Charles H., Boston.
Paige, Clifton H., Mattapan.
Parker, Augustus, Roxbury.
Parker, Charles W., Boston.
Parkman, Henry, Boston.
Parsons, John E., Lenox.
Partridge, Horace, North Cambridge.
Patten, Marcellus A., Tewksbury.
Paul, Alfred W., Dighton.
Peabody, Francis H., Boston.
Peabody George A., Danvers.
Peabody, John E., Salem.
Peabody, S. Endicott, Salem.
Peck, O. H., Denver, Col.
Peck, William G., Arlington.
Peirce, Miss Marion W., Topsfield.
†Perry, George W., Malden.
Pfaff, Col. Charles, South Framingham.
Philbrick, William D., Newton Centre.
Phillips, Mrs. John C., North Beverly.
Phillips, William, North Beverly.
Pierce, Dean, Brookline.
Pierce, George Francis, Neponset.
Poor, John R., Brookline.
Pope, Col. Albert A., Cohasset.
Porter, Alexander S., Boston.
Porter, James C., Wollaston.
Potter, Joseph S., Fredericksburg, Va.

Prang, Louis, Roxbury.
Pratt, Laban, Dorchester.
Pratt, Lucius G., West Newton.
Pratt, Robert M., Boston.
Prendergast, J. M., Boston.
Prescott, Eben C., New York, N. Y.
Pringle, Cyrus G., Charlotte, Vt.
Prouty, Gardner, Littleton.
Putnam, George, Manchester
Putnam, Joshua H., Newton Centre.

Quinby, Hosea M., M.D., Worcester.

Raddin, Everett W., North Cambridge.
Rand, Miss Elizabeth L., Newton Highlands.
Rand, Harry S., North Cambridge.
Rand, Oliver J., Cambridgeport.
Rawson, Warren W., Arlington.
Ray, James F., Franklin.
Ray, Hon. Joseph G., Franklin.
Raymond, Walter, Boston.
Read, Charles A., Manchester.
Reardon, John B., Boston.
Reed, Henry R., Jamaica Plain.
Rice, George C., Worcester.
Richards, John J., Boston.
Richardson, Charles E., Cambridge.
Rinn, J. Ph., Boston.
Ripley, Charles, Dorchester.
Ripley, Ebed L., Hingham Centre.
Robbins, I. Gilbert, Melrose Highlands.
Robinson, John, Salem.
Robinson, Joseph B., Dorchester.
Robinson, Warren J., Somerville.
Rogers, Mrs. Jacob C., Peabody.
Roy, David Frank, Malden.
Ruddick, William H., M.D., South Boston.
Russell, George, Woburn.
Russell, Hon. John E., Leicester.
Russell, Walter, Arlington.

Salisbury, William C. G., Brookline.
Saltonstall, Richard M., Newton.
Sanford, Oliver S., Hyde Park.
Sanger, Mrs. George P., Boston.
Sargent, Charles S., Brookline.
Sargent, Mrs. Charles S., Brookline.
Sargent, Mrs. Francis W., Wellesley
Sawtelle, Eli A., Boston.
Sawyer, Timothy T., Boston.
Schlesinger, Barthold, Brookline.
Scorgie, James C., Cambridge.
†Scott, Charles, Newton.
Sears, Miss Clara E., Boston.
Sears, Miss Emily E., Boston.
Sears, Dr. Henry F., Boston.
Sears, J. Montgomery, Boston.
Sears, Mrs. J. Montgomery, Boston.
Shaler, Nathaniel S., Cambridge.
Shaw, Christopher C., Milford, N.H.
Shaw, Francis, Wayland.
Shaw, Mrs. Robert G., Wellesley.
Sherman, William H., Boston.
Shorey, John L., Lynn.
Shuman, Hon. A., Roxbury.
Sias, Charles D., Wenham.
Siebrecht, H. A., New Rochelle, N.Y.
Simpkins, Miss Mabel, Yarmouth.
Skinner, Francis, Boston.
Skinner, Francis, Jr., Boston.
Sleeper, Henry Davis, Boston.
Smith, Calvin W., Wellesley Hills.
Smith, Charles H., Newton Highlands.
Smith, Charles S., Lincoln.
Smith, Edward N., San Francisco, Cal.
Smith, George O., Boston.
Smith, Thomas Page, Waltham.
Snow, Eugene A., Melrose.
Snow, Samuel T., Cohasset.
Sohier, Col. William D., Beverly.
Souther, Charles H., Jamaica Plain.
Spaulding, Edward, West Newton.
Speare, Alden, Newton Centre.
Spooner, William H., Jamaica Plain.
Sprague, Hon. Charles F., Brookline.

Sprague, Isaac, Wellesley Hills.
Springall, George, Malden.
Stearns, Frank W., Newton.
Stedman, Henry R., M.D., Roslindale.
Stevens, Hon. Moses T., Andover.
Stewart, William J., Winchester.
Stone, Charles W., Boston.
Stone, Prof. George E., Amherst.
Stone, George F., Chestnut Hill.
Strater, Herman, Roxbury.
Strong, William C., Waban.
Swain, Charles E., Roxbury.
Sweet, Everell F., Malden.

Talbot, Mrs. I. Tisdale, Boston.
Tarbell, George G , M.D., Boston.
Taylor, Charles H., Boston.
Taylor, Horace B., Portland, Me.
Temple, Felker L., Boston.
Tenney, C. H., Methuen.
Thayer, Mrs. Alice R., Boston.
Thayer, Eugene V. R., South Lancaster.
Thayer, Mrs. Eugene V. R., South Lancaster.
Thayer, John E., South Lancaster.
Thayer, Mrs. John E., South Lancaster.
Thayer, Nathaniel, Lancaster.
Thayer, Mrs. Nathaniel, Lancaster.
Thayer, S. V. R., Boston.
Thiemann, Hermann, Manchester.
Thomas, W. B., Manchester.
Thurlow, Thomas C., West Newbury.
Tilton, Stephen W., Roxbury.
Todd, John, Hingham.
Tolman, Benjamin, Concord.
Toppan, Roland W., Malden.
Torrey, Everett, Charlestown.
Tower, Miss Ellen May, Lexington.
Trepess, Samuel J., Glencove, L. I., N. Y.
†Turner, John M., Dorchester.
Turner, Roswell W., Boston.

Vander-Woerd, Charles, Waltham.
Vaughan, William Warren, Boston.
Vinal, Miss Mary L., Somerville.

Wakefield, E. H., Cambridge.
Walcott, Henry P., M.D., Cambridge.
Waldo, C. Sidney, Jamaica Plain.
Wales, George O., Braintree.
Walker, Miss Mary Sophia, Waltham.
Walley, Mrs. W. P., Boston.
Walsh, Michael H., Wood's Holl.
Walton, Daniel G., Wakefield.
Ward, Francis Jackson, Roxbury.
Ward, John, Newton Centre.
Ware, Benjamin P., Clifton.
Ware, Miss Mary L., Boston.
Warren, Samuel D., Dedham.
Washburn, Andrew, Hyde Park.
Watson, Benjamin M., Jamaica Plain.
Watson, Thomas A., East Braintree.
Watts, Isaac, Waverly.
Webber, Aaron D., Boston.
Webster, Hollis, Cambridge.
Weld, Christopher Minot, Jamaica Plain.
Weld, George W., Boston.
Weld, Richard H., Boston.
Weld, Gen. Stephen M., Dedham.
West, Mrs. Maria L., Neponset.
Weston, Seth, Chelsea.
Wheeler, Frank, Concord.
Wheeler, James, Brookline.
Wheeler, Wilfred, Concord.
Wheelwright, A. C., Brookline.
Wheelwright, Edmund M., Boston.
Whitcomb, William B., Medford.
White, Francis A., Brookline.
White, George R., Boston.
White, Joseph H., Brookline.
Whitney, Arthur E., Winchester.
Whitney, Ellerton P., Milton.
Whitney, Henry M., Cohasset.
Whittier, George E., Groton.

Whittier, William Benjamin, South Framingham.
Wigglesworth, George, Milton.
Wilbur, George B., West Newton.
Wilder, Edward Baker, Dorchester.
Wilder, Henry A., Malden.
Willard, E. W., Newport, R. I.
Willcutt, Levi L., Brookline.
Williams, Miss Adelia Coffin, Roxbury.
Williams, Benjamin B., Boston.
Williams, John Davis, Boston.
Williams, Philander, Taunton.
Willis, George W., Chelsea.
Willis, Joshua C., Roxbury.
Wilson, Col. Henry W., Boston.
Wilson, William Power, Boston.
Winthrop, Robert C., Jr., Boston.
Wolcott, Hon. Roger, Milton.
Wood, Edmund M., Natick.
Wood, William K., West Newton.
Woods, Henry, Boston.
Wright, George C., West Acton.
Wright, John G., Brookline.
Wyman, Oliver B., Shrewsbury.
Wyman, Windsor H., North Abington.

ANNUAL MEMBERS.

Members of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly communicating to the Secretary the needed corrections.

Allen, Charles L., Floral Park, N. Y.
Alles, William H., Chestnut Hill.
Anderson, George M., Milton.
Arnold, Miss Sarah L., Newton Centre.
Atkinson, Edward, Brookline.
Ayres, Miss Helen F., Medford.

Badlam, William H., Dorchester.
Barker, John G., Melrose.
Barr, John, Wellesley.
Bigelow, Arthur J., Eastlake, Worcester.
Bigelow, Mrs. Nancy J., Southborough.
Bird, John L., Dorchester.
Blomberg, Carl, North Easton.
Bock, William A., North Cambridge.
Bolles, William P., M.D., Roxbury.
Boyden, Clarence F., Taunton.
Braman, George H., Newton.
Breck, Charles H., Newton.
Breck, Charles H. B., Brighton.
Brunton, Frank, Newport, R. I.
Butler, Edward, Wellesley.

Carpenter, Frank O., West Roxbury.
Carter, Mrs. Sarah D. J., Wilmington.
Cary, Miss Alice B., Lexington.
Chase, Joseph S., Malden.
Chase, Leverett M., Roxbury.
Chase, Philip A., Lynn.
Chubbuck, Isaac Y., Roxbury.
Clapp, Henry L., Dorchester.
Clark, John W., North Hadley.
Clark, Joseph, Manchester.
Clark, Theodore M., Newtonville.
Clinkaberry, Henry T., Trenton, N. J.
Collins, Frank S., Malden.
Comley, James, Lexington.
Coolidge, David H., Jr., Boston.
Coolidge, Sumner, East Watertown.
Cotter, Lawrence, Dorchester.
Cotting, Charles U., Boston.
Crosby, J. Allen, Jamaica Plain.
Curtis, Joseph H., Boston
Curtis, Louville, Tyngsborough.

Davis, Frederick, Boston.
Davis, Frederick S., West Roxbury.
Dawson, Charles Jackson, Newark, N. J.
Derby, William H., Revere.
Dolbear, Mrs. Alice J., College Hill.
Doran, Enoch E., Brookline.
Dorr, George B., Boston.
Doyle, William E., East Cambridge.
Duffley, Daniel, Brookline.

Eaton, Warren E., Reading.
Endicott, Miss Charlotte M., Canton.
Eustis, William Tracy, Brookline.
Ewell, Marshall F., Marshfield Hills.

Fenno, Warren, Revere.
Fisher, Sewall, Framingham.

Fitzgerald, Desmond, Brookline.
Fletcher, Fred W., Auburndale.
Forbes, William H., Jamaica Plain.
Francis, George E., M.D., Worcester.
Frost, Varnum, Arlington.
Fuller, T. Otis, Needham.

Gibbon, Mrs. James A., Boston.
Gill, Mrs. E. M., Medford.
Gilman, Hon. Virgil C., Nashua, N. H.
Grant, Charles E., Concord.
Grew, Henry Sturgis, Boston.
Grey, Thomas J., Chelsea.

Hall, Charles H., M.D., Corning, Cal.
Hall, Stacy, Boston.
Hallstram, Charles W., Boston.
Hargraves, William J., Jamaica Plain.
Harris, Frederick L., Wellesley.
Harrison, C. S., York, Nebraska.
Harrison, Thomas, Melrose Highlands.
Hartwell, Samuel, Lincoln.
Hatfield, T. D., Wellesley.
Hersey, Alfred H., Hingham.
Hersey, Edmund, Hingham.
Heustis, Warren H., Belmont.
Hill, J. Willard, Belmont.
Hinds, Warren D., Townsend.
Hobbs, George M., Boston.
Hollis, George, South Weymouth.
Houghton, George S., West Newton.
Hubbard, F. Tracey, Cambridge.
Huston, Miss Katharine W., Jamaica Plain.

Ireland, Robert D., Winthrop.

James, Robert Kent, Dorchester.
Jameson, G. W., East Lexington.

Keith, Mrs. Mary R., Washington, D. C.
Kelsey, Harlan P., Boston.
Kemp, William S., Brookline.
Kennard, Frederic H., Brookline.
Kenrick, Miss Anna C., Newton.
Kinney, H. R., Worcester.

Lancaster, Mrs. E. M., Roxbury.
Laurie, Robert, Newport, R. I.
Lincoln, Miss Agnes W., Medford.
Lomax, George H., Somerville.
Loring, Charles G., Boston.
Loring, William C., Beverly.
Lothrop, Thornton K., Boston.
Low, Hon. Aaron, Hingham.

Manda, W. A., South Orange, N. J.
Manning, A. Chandler, Reading.
Martin, William J., Milton.
Masten, Cornelius E., Dorchester.
Maynard, Charles, North Easton.
McLaren, Anthony, Westwood.
Meriam, Horatio C., D.M.D., Salem.
Metcalf, Dr. Ben H., Winthrop.
Milman, William, Roxbury.
Moody, Abner J., Boston.
Moore, George D., Arlington.
Morgan, George M., Boston.
Morison, George Abbot, Cambridge.
Morrison, William, Cohasset.
Moseley, Frederick Strong, Newburyport.
Munson, Prof. W. M., Oroho, Me.

Newton, John F., Roxbury.
Nicholson, William, Framingham.
Norton, Michael H., Boston.
Norton, Patrick, Dorchester.

Olmsted, Frederick Law, Brookline.

Park, William D., Boston.
Parker, John, Newtonville.
Parker, Walter S., Reading.
Patterson, William, Quincy.
Peirce, George H., Concord Junction.

Petremant, Robert, Brooklyn, N. Y.
Pettigrew, John A., Jamaica Plain.
Pickman, Dudley L., Boston.
Pierce, Mrs. F. A., Brookline.
Plimpton, Willard P., West Newton.
Pray, James Sturgis, Cambridge.
Purdie, George A., Wellesley Hills.

Rea, Charles H., Norwood.
Rea, Frederic J., Norwood.
Rich, Miss Ruth G., Dorchester.
Rich, William E. C., Roxbury.
Rich, William P., Chelsea.
Richards, Mrs. P. D., West Medford.
Robbins, Oliver R., Weston.
Robinson, Walter A., Arlington.
Ross, Charles W., Newtonville.
Ross, Henry Wilson, Newtonville.
Rothwell, James E., Brookline.

Sander, Charles, Brookline.
Saunders, Miss Mary T., Salem.
Scott, Augustus E., Lexington.
Scudder, Samuel H., Cambridge.
Searles, E. F., Methuen.
Seaver, Edwin P., LL.D., Waban.
Sharp, Miss Helen, Boston.
Sharples, Stephen P., Cambridge.
Shaw, Hon. Edward P., Newburyport.
Shepard, Harvey N., Boston.
Sheppard, Edwin, Lowell.
Southworth, Edward, Quincy.
Squire, Miss Esther A., North Cambridge.
Stearns, Mrs. Charles A., East Watertown.
Stearns, Charles H., Brookline.
Stevens, Mrs. Mary L., Cambridge.
Stevens, Miss Mary O., North Andover.
Stone, Joshua C., Watertown.
Storer, Charles, Providence, R. I.
Story, Miss Sarah W., Brighton.
Strange, David T., Stoneham.
Sullivan, Michael, Revere.
Sutherland, George A., Roslindale.
Swan, Charles W., M.D., Brookline.

Tailby, Joseph, Wellesley.
Teele, William H., West Acton.
Terry, Rev. Calvin, North Weymouth.
Thatcher, William, Brookline.
Tobey, Rufus T., Roxbury.
Travis, Charles B., Brighton.
Tyndale, Theodore H., Brookline.

Vaughan, J. C., Chicago, Ill.

Warren, Samuel H., Weston.
Welch, Patrick, Dorchester.
Westwood, Thomas H., Jamaica Plain.
Wheeler, Henry A., Newtonville.
White, Maurice P., Roxbury.
White, W. Henry, Lowell.
Whitney, Joseph, Cambridgeport.
Whiton, Hon. Starkes, Hingham Centre.
Wilkie, Edward A., Newtonville.
Winter, William C., Mansfield.
Wolcott, Mrs. H. L. T., Dedham.
Wood, Mrs. Anna D., West Newton.
Wood, Elijah A., West Newton.
Wood, E. W., West Newton.
Woodford, Joseph H., Boston.
Woods, Henry F., Boston.

Young, Charles S., Newton Centre.
Young, E. Bentley, Boston.

Zirngiebel, Denys, Needham.

EXTRACTS FROM THE CONSTITUTION AND BY-LAWS.

SECTION XXII.

Life Members.

The payment of thirty dollars shall constitute a Life Membership, and exempt the member from all future assessments, and any Annual Member, having paid all dues, may become a Life Member by the payment of twenty dollars in addition thereto.

Annual Membership.

Every Annual Member, before he receives his diploma, or exercises the privileges of a member, shall pay the sum of ten dollars as an admission fee, and shall be subject afterwards to an annual assessment of two dollars.

SECTION XXIII.

Withdrawal or Discontinuance of Membership.

Any member may withdraw from the Society, on giving notice to the Treasurer and paying the amount due from him. Any member who shall neglect for the space of two years to pay his annual assessment, after due notice from the Treasurer, shall cease to be a member. The Treasurer shall give notice of such withdrawals or discontinuances to the Secretary, who shall erase such members' names from the list.

The attention of Annual Members is particularly called to Section XXIII.

HONORARY MEMBERS.

Members and correspondents of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly communicating to the Secretary the needed corrections.

Information, or any clew to it, is especially desired in regard to Joseph Maxwell, *elected in* 1830, *and* George W. Smith, *elected in* 1851.

Hon. George S. Boutwell, Groton.
H. W. S. Cleveland, Chicago, Ill.
Joseph Jefferson, Buzzard's Bay.
Major L. A. Huguet-Latour, M. P., Montreal, Canada.
Joseph Maxwell, Rio Janeiro, Brazil.
Donald G. Mitchell, New Haven, Conn.
Hon. J. Sterling Morton, Ex-Secretary of Agriculture, Nebraska City, Neb.
Baron R. Von Osten Sacken, Heidelberg, Germany.
Samuel B. Parsons, Flushing, N. Y.
George W. Smith, Boston.
Hon. James Wilson, Secretary of Agriculture, Washington, D. C.

CORRESPONDING MEMBERS.

Members and correspondents of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly reporting to the Secretary the needed corrections.

Information, or any clew to it, is especially desired in regard to Alexander Burton, *elected in* 1829; S. Reynolds, M.D., 1832; *and* Francis Summerest (or Summerer), 1833.

Édouard André, Editor-in-chief of the Revue Horticole, Paris, France.

Professor L. H. Bailey, Horticultural Department, Cornell University, Ithaca, N. Y.

John Gilbert Baker, F.R.S., F.L.S., Keeper of the Herbarium of the Royal Gardens, Kew.

Charles Baltet, Président de la Société Horticole, Vigneronne, et Forestière de l' Aube, Troyes, France.

Peter Barr, London, England.

Archibald F. Barron, Turnham Green, London, W.

Napoleon Baumann, Bolwiller, Alsace.

D. W. Beadle, 303 Crawford St., Toronto, Ontario.

Professor William J. Beal, Agricultural College, Michigan.

Prosper J. Berckmans, Ex-President of the American Pomological Society, Augusta, Ga.

Charles E. Bessey, Ph.D., Professor of Botany in the Industrial College of the University of Nebraska, Lincoln.

Dr. Ch. Bolle, Berlin, Prussia.

John Croumbie Brown, LL.D., Haddington, Scotland.

Professor J. L. Budd, Ames, Iowa.

William Bull, Chelsea, England.

F. W. Burbidge, M.A., Trinity College Botanic Garden, Dublin, Ireland.

Alexander Burton, United States Consul at Cadiz, Spain, Philadelphia.

Maxime Cornu, Director of the Jardin des Plantes, Paris, France.

Daniel T. Curtis, Dorchester.

Rev. H. Honywood D'Ombrain, Westwell Vicarage, Ashford, Kent, England.

W. T. Thiselton Dyer, C.M.G., F.R.S., Director of the Royal Botanic Gardens, Kew, England.

PARKER EARLE, President of the American Horticultural Society, Roswell, N.M.

GEORGE ELLWANGER, Rochester, N.Y.

HENRY JOHN ELWES, F.L,S., F.Z.S., Colesborn, Andoversford, Gloucestershire, England.

WILLIAM G. FARLOW, M.D., Professor of Cryptogamic Botany, Harvard University.

B. E. FERNOW, Forestry School, Cornell University, Ithaca, N. Y.

HON. ROBERT W. FURNAS, Ex-President of the Nebraska State Horticultural Society, Brownville.

CHARLES A. GOESSMANN, Ph.D., LL.D., Chemist of the Hatch Experiment Station of the Massachusetts Agricultural College, Amherst.

GEORGE L. GOODALE, M. D., Professor of Botany, Harvard University, Cambridge.

OBADIAH B. HADWEN, President of the Worcester County Horticultural Society, Worcester.

PROFESSOR BYRON D, HALSTED, Botanist and Horticulturist at the New Jersey Agricultural Experiment Station, New Brunswick, N. J.

J. H. HART, Superintendent of the Botanic Garden, Trinidad.

DR. F. M. HEXAMER, Editor of the American Agriculturist, New York.

J. W. HOFFMANN, Colored State University, Orangeburg, S. C.

J. C. HOLDING, Ex-Treasurer and Secretary of the Cape of Good Hope Agricultural Society, Cape Town, Africa.

THE VERY REV. S. REYNOLDS HOLE, D.D., Dean of Rochester, Rochester, England.

SIR JOSEPH HOOKER, K.C.S.I., The Camp, Sunningdale, England.

JOSIAH HOOPES, West Chester, Pa.

GEORGE HUSMANN, Napa, Cal.

WILLIAM J. JOHNSON, M. D., Fort Gaines, Ga.

CHARLES JOLY, Honorary Vice-President of the Société Nationale d'Horticulture de France, Paris.

SIR GEORGE KING, Superintendent of the Royal Botanic Garden, Calcutta.

PROFESSOR WILLIAM R. LAZENBY, Department of Horticulture and Forestry; Secretary College of Agriculture and Domestic Science, Ohio State University, Columbus, O.

MAX LEICHTLIN, Baden-Baden, Germany.

G. F. B. LEIGHTON, President of the Norfolk Horticultural and Pomological Society, Norfolk, Va.

VICTOR LEMOINE, Nancy, France.

T. T. LYON, President of the Michigan Horticultural Society, South Haven.

DR. PETER MACOWAN, Director of the Botanic Garden, Cape Town, Africa.

DR. MAXWELL T. MASTERS, Editor of the Gardeners' Chronicle, London.

GEORGE MAW, Benthal, Kinley, Surrey, England.

T. C. MAXWELL, Geneva, N. Y.

THOMAS MEEHAN, Germantown, Pa.

DR. CHARLES MOHR, Mobile, Ala.

F. W. Moore, A. L. S., Curator of the Royal Botanic Gardens, Glasnevin, Dublin, Ireland.

Dr. Daniel Morris, C.M.G., D.Sc., M.A., F.L.S., Assistant Director of the Royal Botanic Gardens, Kew, England.

George Nicholson, Curator of the Royal Gardens, Kew, England.

Peter Nøvik, Secretary of the Norwegian Horticultural Society, Christiania.

William Paul, Waltham Cross, London, N.

Professor D. P. Penhallow, Director of the Botanic Garden, Montreal, Canada.

Henry Probasco, Cincinnati, O.

P. T. Quinn, Newark, N. J.

Cavalière Enrico Ragusa, Palermo, Sicily.

D. Redmond, Ocean Springs, Miss.

S. Reynolds, M. D., Schenectady, N. Y.

Benjamin Lincoln Robinson, Ph.D., Curator of the Gray Herbarium of Harvard University, Cambridge.

William Robinson, Editor of Gardening Illustrated, London.

Edgar Sanders, Chicago, Ill.

William Saunders, Horticulturist and Superintendent of Garden and Grounds, Department of Agriculture, Washington, D. C.

William R. Smith, Superintendent of the Botanic Garden, Washington, D. C.

Robert W. Starr, Port William, N. S.

Dr. Joseph Stayman, Leavenworth, Kan.

William Sumner, Pomaria, S. C.

Francis Summerest.

William Trelease, Director of the Missouri Botanic Garden, St. Louis.

Dr. Melchior Treub, Director of the Botanic Garden, Buitenzorg, Java.

H. J. Veitch, Chelsea, England.

William Watson, Assistant Curator of the Royal Gardens, Kew, England.

CONTENTS.

PAGE

BUSINESS MEETING, April 1, 1899; Additional appropriation for Garden Committee p. 133; Appropriation for Committee on Forestry, etc., 133; Election of one Corresponding and six Immediate Members, 133; Decease of Azell C. Bowditch announced and successor elected, 134; Committee empowered to fill vacancy, 134; Land for new building . 134

BUSINESS MEETING (SPECIAL), April 22; Purchase of Land and Erection of Building, and Sale of Estate 134–137

BUSINESS MEETING, May 6; Committee on Building, p. 137; Vacancy in Committee on Plants filled, 137; Decease of Waldo O. Ross, Azell C. Bowditch, and Charles Naudin announced, 138; Forty-one members elected 138, 139

BUSINESS MEETING, June 3; Memorials of Azell C. Bowditch and Waldo O. Ross, p. 140; Decease of Malcolm Dunn announced, 141; Vacancy in Committee on Forestry announced and filled, 141; Additional appropriation for Committee on School Gardens, etc., asked for, 141; Twelve members elected 141, 142

BUSINESS MEETING, July 1; Mural tablets in New Building 142

BUSINESS MEETING, August 5; Committee on Nominations, p. 142; Delegates to American Pomological Society 142, 143

BUSINESS MEETING, September 2; Nominations reported, p. 143; Communications from U. S. Department of Agriculture, 143; From American Rose Society, 144; Arrangements for Delegates to American Pomological Society announced, 144; Decease of B. G. Smith and H. L. de Vilmorin announced, 144; Forty-nine members elected 144, 145

BUSINESS MEETING, Oct. 7, 1899; Memorials of Benjamin G. Smith, pp. 146–148, and David Nevins, 148; Amendment to Constitution proposed, 149; Annual Election, 149; Thirty-one members elected, 149, 150; Experiments concerning potash and soda 151

BUSINESS MEETING, November 4; Amendment to Constitution and By-Laws, pp. 150, 151; Appropriations for 1900, 151; Vote concerning Statues, Tablets, etc., 151; Seventeen members elected 152

BUSINESS MEETING, December 2; List of Prizes for 1900 presented, p. 152; Reports of Flower and Vegetable Committees and Secretary and Librarian presented, 152; Chairman of Library Committee granted further time, 153; Chairmen of Committees to be notified, 153; Report from Building Committee, 153; Changes in Schedule of Prizes printed, 153; Four members elected 153

BUSINESS MEETING, December 16; Reports of Committees on Plants, Arrangements, Gardens, Library, Lectures, etc., Forestry, etc., School Gardens, etc., presented, pp. 153, 154; Further time granted to Fruit Committee and Delegate to State Board of Agriculture 154

REPORT OF COMMITTEE ON PLANTS; Introduction, pp. 155-157; Saturday Exhibitions, 157, 158, 159, 160; Rhododendron Show, 158; Annual Exhibition, 158; Annual Exhibition of Fruits and Vegetables, 159; Chrysanthemum Show, 159, 160; Financial Statement, 160; Prizes and Gratuities awarded 161-174

REPORT OF COMMITTEE ON FLOWERS; Introduction, p. 175; Saturday Exhibitions, 175, 176, 177, 178, 179; Spring Exhibition, 176; Rhododendron Show, 176; Pæony Show, 176; Rose Exhibition, 177; Exhibition of Aquatic Plants and Flowers, 178; Annual Exhibition, 178, 179; Chrysanthemum Show, 179, 189; Exhibition of Hardy Perennials, 180; Financial Statement, 180; Prizes and Gratuities awarded . . . 181-199

REPORT OF COMMITTEE ON FRUITS, pp. 200, 201; Prizes and Gratuities awarded 202-222

REPORT OF COMMITTEE ON VEGETABLES, pp. 223, 224; Prizes and Gratuities awarded 225-245

REPORT OF COMMITTEE ON GARDENS; Introduction, p. 246; F. A. Blake's Carnation House, 246; W. Nicholson's Tomato House, 246, 247; E. M. Bruce's Cucumber House, 247; Mrs. David Nevins's Estate, 247; C. H. Tenney's Estate, 248; W. C. Winter's House of Foreign Grapes and Tomatoes, 248; W. H. Heustis's Strawberry Garden, 248; G. D. Moore's Vegetable Garden, 248, 249; S. & F. E. Coolidge's Vegetable Farm, 249; A. F. Estabrook's Grounds, 249; The Oliver Ames Estate, 249, 250; G. A. James's Estate, 250; Col. F. Mason's Vegetable Garden, 250, 251; Col. C. Pfaff's Estate, 251; Mrs. B. P. Cheney's Chrysanthemum House, 251, 252; E. Hatch's Estate, 252; E. M. Wood & Co.'s Conservatories, 252, 253; Prizes and Gratuities awarded 253, 254

REPORT OF COMMITTEE ON SCHOOL GARDENS, ETC., George Putnam School Garden, pp. 256-260; Report on the Medford School Gardens, 261-268; Framingham State Normal School Garden, 269, 270; Wenham School Gardens, 270, 271; School Garden at Bath, Me., 271, 272; School Gardens, by Dr. F. M. Powell, 272, 273; German School Gardens, 273-275; School Garden Prizes, 275, 276; Children's Herbariums, 277, 278; Fairbanks Museum Prizes, 278; Prizes and Gratuities awarded 279, 280

REPORT OF COMMITTEE ON NATIVE PLANTS; pp. 281-287; Prizes and Gratuities awarded 288-290

REPORT OF COMMITTEE ON FORESTRY AND ROADSIDE IMPROVEMENT . . 291, 292

REPORT OF COMMITTEE OF ARRANGEMENTS 293, 294

REPORT TO THE STATE BOARD OF AGRICULTURE 295, 296

REPORT OF COMMITTEE ON LECTURES AND PUBLICATION 297, 298

REPORT OF COMMITTEE ON THE LIBRARY 299

REPORT OF THE SECRETARY AND LIBRARIAN 300–302

REPORT OF THE TREASURER AND FINANCE COMMITTEE 303–307

MOUNT AUBURN CEMETERY 308–309

OFFICERS AND STANDING COMMITTEES 310–312

EXTRACTS FROM THE CONSTITUTION AND BY-LAWS 325

MEMBERS OF THE SOCIETY; Life, pp. 303–321; Annual, 322–324; Honorary, 326; Corresponding 327–329

TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1900.

PART I.

BOSTON:
PRINTED FOR THE SOCIETY.
1900.

☞ SEE LAST PAGE OF COVER.

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CONTENTS.

PAGE

PREFATORY NOTE 3

BUSINESS MEETING, Jan. 6, 1900; Appropriations for 1900, pp. 5, 6; Appointment of Treasurer, Secretary, etc., 6; President's Address, 6-10; Vote to appoint Committee on Constitution and By-Laws, 10; Vote to have plans for new building submitted, 10: Programmes of Lectures, 10; Six members elected 10

MEETING FOR LECTURE AND DISCUSSION, Jan. 13; The Rusts of Horticultural Plants, by Professor Byron D. Halsted, (Illustrated) pp. 11-28; Description of Plates, 28, 29; Discussion 29

MEETING FOR LECTURE AND DISCUSSION, Jan. 20; A Half Century's Experience with Ornamental Tree Planting, by O. B. Hadwen, pp. 30-38; Discussion, 39-41; Invitation 41

MEETING FOR LECTURE AND DISCUSSION, Jan. 27; The Procession of Flowers in Pennsylvania, by Miss M. L. Dock 42-49

BUSINESS MEETING, Feb. 3; Treasurer's Report read, p. 50; Letter from President of Harvard University, 50; Eight members elected . . . 51

MEETING FOR LECTURE AND DISCUSSION, Feb. 10; Gardens, Fields, and Wilds of the Hawaiian Islands, by J. K. M. L. Farquhar 51-57

MEETING FOR LECTURE AND DISCUSSION, Feb. 17; The Future Outlook for the Fruit Grower, by S. D. Willard, pp. 57-65; Discussion . . . 65-67

MEETING FOR LECTURE AND DISCUSSION, Feb. 24; Forestry in Massachusetts, by Mrs. Mary L. Tucker 68-89

BUSINESS MEETING, March 3; Carnation Show at Flower Market, p. 90; Photographs and Biographies in Transactions, 90; Six members elected . 90

MEETING FOR LECTURE AND DISCUSSION, March 10; The Improvement of the Carnation in America (Illustrated), by C. W. Ward 91-101

MEETING FOR LECTURE AND DISCUSSION, March 17; Japanese Plums, by George S. Butler, pp. 102-108; Discussion 109, 110

MEETING FOR LECTURE AND DISCUSSION, March 24; Apple Culture for Profit, by J. H. Hale, pp. 111-115; Discussion 115, 116

MEETING FOR LECTURE AND DISCUSSION, March 31; Fungus Diseases of Cucumbers, Tomatoes, and Lettuce under Glass, by Prof. George E. Stone, pp. 117-122; Discussion, 122-125; Closing Proceedings 125, 126

The following lectures have been circulated to some extent in the form of slips reprinted from the reports made by the Secretary of the Society in the "Boston Evening Transcript." As here presented, the lectures are, as far as possible, printed in full, and reports of the discussions following the lectures are added, these, where it appeared necessary, having been carefully revised by the speakers.

The Committee on Lectures and Publication take this opportunity to repeat what they have before stated, that the Society is not to be held responsible for the certainty of the statements, the correctness of the opinions, or the accuracy of the nomenclature, in the lectures and discussions now or heretofore published, all of which must rest on the credit or judgment of the respective writers or speakers, the Society undertaking only to present these papers and discussions, or the substance of them, correctly.

AARON LOW,
J. H. BOWDITCH,
E. W. WOOD,
Committee on Lectures and Publication.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, January 6, 1900.

A duly notified stated meeting of the Society was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

The following appropriations, recommended by the Executive Committee on the 4th of November, 1899, came up for final action:

For Prizes and Gratuities for the year 1900:	
For Plants	$2,000.00
For Flowers	2,531.50
For Native Plants	186.50
For Fruits	1,732.00
For Vegetables	1,200.00
For Gardens	500.00
Total	$8,150.00

The President, as Chairman of the Executive Committee, reported that at a meeting of that Committee, held December 23, 1899, it was voted to recommend further appropriations for the year 1900 as follows:

For the Library Committee for the increase and preservation of the Library	$700.00
For the Committee on Lectures and Discussions, this sum to include the income of $50 from the John Lewis Russell Fund	250.00

For the Committee of Arrangements, this sum to cover all extraordinary expenses of said Committee .	300.00
For the Committee on School Gardens and Children's Herbariums, for Prizes	125.00
For the same Committee for incidental expenses .	75.00
For the Committee on Forestry and Roadside Improvement	150.00
For Salaries	3,000.00

The above report was accepted and the appropriations recommended were unanimously voted.

The President further reported that at the same meeting the Executive Committee appointed Charles E. Richardson to be Treasurer and Superintendent of the Building, and Robert Manning to be Secretary and Librarian, for the year 1900.

The President then delivered his annual address, as follows:

Massachusetts Horticulture.

It is well that we should occasionally look backwards from the several periods of success, in the progress forwards of citizens of this educational Commonwealth of Massachusetts in advancing horticulture.

We can too easily forget the wisely chosen words in our Charter, which forms the basis for our Constitution and By-Laws, and a motive for our General Rules and Regulations.

During the latter part of the year 1828, as I quote from writings of our first President, Gen. H. A. S. Dearborn, "a number of gentlemen of Boston, and the surrounding towns" decided that there was need of organized effort "for the purpose of encouraging and improving the science and practice of Horticulture, and promoting the amelioration of the various species of trees, fruits, plants, and vegetables, and the introduction of new species and varieties," and I have quoted their objects exactly as they can be found in the Act of Incorporation, as agreed to by the Legislature of 1829, and signed 12 June, 1829, by Governor Levi Lincoln.

Judge Buel of Albany, in 1828, wrote in his paper "The Cultivator" "Why do not the Boston gentlemen start a Horticultural Society?" "There is more talent in Boston for such an Association than in any place in the United States."

And so it was that "sixteen gentlemen," merchants with landed estates, and men who were students of rural affairs and directed the cultivation of their lands, met, and, we can say, founded this Horticultural Society. Others, with purely patriotic instinct, or with that spirit which sees where good can be done, and is ambitious to share in it, were induced to join with the "sixteen," and this Society soon became a reality.

On the 24th of February, 1829, those sixteen gentlemen met in the insurance office of Zebedee Cook, Jr., with that noted horticultural student, and lover of rural affairs, Hon. John Lowell, in the chair.

There were around him :— Robert L. Emmons, Boston; Benjamin V. French, whose estate was in Braintree, with model barn, fine apple and other fruit orchards, with farming and pasture lands; Gen. H. A. S. Dearborn, Roxbury; Cheever Newhall, a cultivator of fruits of great variety, with his lands situated in Dorchester; Enoch Bartlett, Roxbury; Samuel Downer, with estate in Dorchester near Savin Hill, noted for the high quality of fruits and vegetables raised there; Robert Manning and John M. Ives, both of Salem, and both noted as students and growers of fruits and trees of the highest quality; William Kenrick of Newton and Jonathan Winship of Brighton, to whose horticultural knowledge, and early nurseries of fruits and ornamental trees, the public were and are indebted for the advances that we find, I may say, in many ways in such lines of work today; Gen. W. H. Sumner of Dorchester; John B. Russell of Boston; and Andrews Breed and his brother Henry A. of Lynn, must not be forgotten among the early "sixteen" establishers of this Society. They builded better than they knew, and the responsibilities they have given us now rest upon our shoulders.

The first Act of 1829 gave the right to hold property to the value of $10,000 real and $20,000 personal, estate. That right has, from time to time, been increased until now it stands at a total of $1,000,000 real and personal, under an Act passed during my administration.

During the past year the Society has established a Committee with power to erect a building on one-half an acre of land, which has been purchased and is now the property of this Society.

Your Building Committee has, with the architects, given much time and thought to the matter. Had our plans been complete, when we were first authorized to act, it is estimated that the

amount appropriated would have been sufficient. The sudden and great rise in value of building material has caused your Committee to postpone further action until spring, in the hope that conditions may then be more favorable to us. We feel that a plan has been evolved that will be heartily approved, but, with the uncertainties that confront us, your Committee have decided that the plans, as they now exist, be not yet made public. Under these conditions we have an interest charge that makes it necessary, as at all like times of transformation, to ask economy in all possible ways to meet it, and it must be by the aid of our Committees that this can be done. The receipts from our halls and exhibitions were formerly a considerable sum, and that fact was proof of the large attendance of persons then at our exhibitions. Now the receipts from our halls and exhibitions are insignificantly small, and are indicative of the smallness of attendance at exhibitions, and the small amounts there received. We have now two exhibitions, one in spring and one in autumn, when entrance fees are charged and which are especially advertised; while we held twenty-three free exhibitions during the past year.

It seems to me that this Society would be in a position to do more advanced and beneficial work under our chartered responsibilities, and interest more people in our exhibitions, our lectures, and our library, if more, perhaps all, of our exhibitions, were with entrance fees. It may prove wise to decrease the number of our scheduled exhibitions. Our charity should, to be the best, be gauged to meet the intelligence in horticulture that we desire to promote. The mere payment of money prizes does not accomplish this, but it is the high standard that we set at our exhibitions, which will encourage advanced quality in plants, flowers, fruits, vegetables, etc. It should be to advance the quality of those, as we find them in the market, and hold them at a high standard, that we should direct our plan of management.

It was among the early efforts of our founders to do much of the work that now is among the duties of our endowed Agricultural Experiment Stations, National and State, namely, to first, encourage the growth of any varieties of fruits and vegetables that our markets lacked; second, to elevate the quality of those varieties; and third, when that had been well done by many whom I have named, and Mr. Wilder and others later, efforts were turned to the more æsthetic with plants, flowers, trees, shrubs, etc.

But now that so much is being done in these lines so admirably by commercial interests and endowed institutions, in our interests, it would seem that we could develop more fully and carefully both our library work, and exhibition work, and I urge thoughtful considerations on these lines.

It would also seem that we should, and could, advance the displays at, and plans for, our exhibitions as popular and paying, income-yielding Shows, in such location as we have chosen for our new home, and bring a large attendance from the metropolitan district. We have only to ask, I am sure, the coöperation of the Street and Steam Railways, and the business houses in this city to make such a plan a success.

I have, like many of you, been a member or manager at some of the largest exhibitions through New England, and in New York State and City, and have seen enough of similar exhibitions across the ocean and in parts of the West to know the possibilities in this direction, and also to realize that, with the vast population which can be centered at the location of our new home, such only need the proper incentive, intelligently put, to make our receipts worthy of such effort.

The early gardens of private estates yielded the fruits and vegetables for our early markets. Now there is a business in each. Plants and flowers next were developed on such estates, and distributed in like manner. Then, and next in order, a business in flowers grew up with a chief market in New York. Thus New York developed her own producing grounds and glass. Boston had developed as a consumer of flowers, and used her own product largely. The business of fruit, vegetable, plant, and flower culture has become a science, and a high quality now reigns in our markets.

That is largely what this Society was established to accomplish and it has done that work well. New and advanced varieties are what it has now to strive for; and by exhibits of highest quality alone can that be approached. Quality, the highest that the market can show, should be our standard, and by that are we to stimulate the inventive grower in all lines.

With our library in improved quarters the student is helped along such lines, and, by such ease of study, is he encouraged in his work.

Our Constitution and By-Laws, and our General Rules and Regulations, should be fully lived up to; and should by frequent study and careful inspection be kept abreast of our needs, and at the standard for the times in which we live, the basis thereof to be the Charter that we hold from the Commonwealth of Massachusetts.

On motion of Ex-President William H. Spooner, it was voted that a copy of the President's address be requested for publication.

William J. Stewart made the following motion:— That the President be requested to appoint a Committee of five members to report at some future meeting whether there are any changes which may appear to them desirable to make in the Constitution and By-Laws. This motion was carried. Mr. Stewart requested that he might not be appointed Chairman of the Committee.

Ex-President William C. Strong presented the following vote:— Whereas it is believed that the cost of constructing a new building upon the land recently purchased by this Society will largely exceed the estimated cost, it is therefore voted that the Building Committee be instructed to submit plans for a new building to the Society for its inspection and approval, before any contracts are made for such work. This motion was carried.

The President announced that the Programmes of Lectures for the present season were ready, and that the first would be delivered by Professor Byron D. Halsted of the New Jersey Agricultural College Experiment Station, New Brunswick, N. J., on the next Saturday.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:—

Mrs. Oliver Ames, Senior, of North Easton.
Miss Susan E. Ames, of North Easton.
Lamont G. Burnham, of Essex.
Walter Cutting, of Pittsfield.
Edmund C. Eastman, of Brookline.
Robert M. Morse, of Jamaica Plain.

Adjourned to Saturday, February 3.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, January 13, 1900.

A meeting for Lecture and Discussion was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

The following lecture was delivered on the John Lewis Russell foundation:

THE RUSTS OF HORTICULTURAL PLANTS.

By Professor BYRON D. HALSTED, Botanist and Horticulturist at the New Jersey Agricultural Experiment Station, New Brunswick, N. J.

After accepting the honored invitation to open this annual course of lectures and being informed by the Chairman of the Lecture Committee that my subject in a general way was "Parasitic Fungi," I naturally sought my file of the TRANSACTIONS of your Society.

It was found that a series of annual lectures upon fungi began nine years ago when Dr. Farlow presented his exposition of the "Diseases of Trees Likely to follow Mechanical Injuries." In 1892 the much lamented Professor J. E. Humphrey, then of the Agricultural Experiment Station of your State, gave you his lecture upon "Fungous Diseases and Their Remedies," in which the nature of fungi was described and some of the various forms considered. The next February brought you Professor Galloway of the United States Department of Agriculture with his paper upon "Combating the Fungous Diseases of Plants," in which you received the latest advices as to formulas for fungicides and the best methods of applying the mixtures. In 1894 Dr. W. C. Sturgis of the Connecticut Experiment Station chose for his subject the single word "Fungi," and under it gave a full explanation of the low group of plants embraced by his title, but not overlooking that side of the subject that deals with the remedies for, and the destruction of fungi. The next year the speaker was privileged to present a paper upon "Fungous Diseases of Ornamental Plants," and a year later Professor Atkinson of Cornell University gave a lecture upon "Some Tendencies and Problems in the Evolution of Species Among Parasitic Fungi." This was followed in 1897 by Dr. E. F. Smith's address on "The Spread of Plant Diseases" in which some of the ways that parasitic

organisms are disseminated were considered. In 1898 "The Resistance of Plants to Parasitic Fungi" was the title of the lecture by Dr. E. A. Burt of Middlebury College of Vermont and a year ago Professor Sedgwick of your Institute of Technology gave his paper, "Ancient and Modern Theories of Diseases with Special Reference to Diseases of Plants caused by Parasitic Fungi."

This review by title of the nine preceding lectures has been made in justification of my assumption that the majority of those present today are sufficiently familiar with fungi to warrant me in selecting one of the leading groups and proceeding at once to its consideration without any further preliminary parley.

The fungi are separated into many families and of these one of the more distinct and conspicuous of the groups of the parasitic species is the *Rusts* or *Uredineae*.

Statistics are dry, and tables of figures are not apt to produce laughter; therefore in passing it will only be said that the rusts include about fifteen hundred species, arranged in twenty-five genera. While there may be some striking differences as seen by the naked eye the rusts are in all their details strictly microscopic. They infest nearly all groups of plants and are met with upon stem, leaf, flower, and fruit, although seldom showing their presence on any subterranean portions of the host.

Structurally, like most of the fungi, the rusts consist of slender threads called the mycelium, which is the vegetative portion, and the reproductive bodies known as the spores.

An interesting feature of the Uredineae is that of the different forms of spores produced by the same species, and these are so unlike that it was only after full demonstration that they have been associated as stages in the life cycle of the same rust. Furthermore these different forms may grow only upon widely unrelated host plants. This Polymorphism is the foundation of some of the relationships between plants observed by farmers and others centuries ago. Permit me to quote a few lines from the Province Laws of Massachusetts for 1736–1761. "An act to prevent damage to English grains arising from barberry bushes.

"Whereas it has been found by experience, that the Blasting of Wheat and other English Grain is often occasioned by Barberry bushes, to the great loss and damage of the inhabitants of this province:—

"Be it therefore enacted by the Governor, Council, and House of Representatives, that whoever, whether community or private person, hath any barberry Bushes standing or growing in his or their Land, within any of the Towns in this Province, he or they shall cause the same to be extirpated or destroyed on or before the thirteenth day of June, Anno Domini One Thousand Seven Hundred and Sixty.

"Be it further enacted that if there shall be any Barberry Bushes standing or growing in any land within this Province, after the said 13th day of June, it shall be lawful, by Virtue of this Act, for any Person whosoever to enter the Lands within which such barberry Bushes are, first giving one month's notice of his intention so to do to the Owner or Occupant thereof, and to cut them down, or pull them up by the root, and then to present a fair account of his labour and charge therein to the owner or occupant of the said land and if such owner or occupant shall neglect or refuse by the space of two months next after the presenting of said account, to make to such person reasonable payment as aforesaid, then the person who cut down or pulled up such bushes, may bring the action against such owner or occupant, owners or occupants, before any Justice of the Peace, if under forty shillings, or otherwise before the Inferior Court of Common Pleas in the County where such Bushes grew, who upon proof of the cutting down or pulling up of such bushes by the person who brings the action, or such as were employed by him, shall and is hereby respectively empowered to enter up judgment for him to recover double the value of the reasonable expense and labour in such service and award execution accordingly."

At the time of the above enactment the nature of the influence of the barberry upon the grain was not known. It was often observed that the grain was more rusted in the vicinity of the bushes than elsewhere and many theories arose as to the cause of this. It seemed evident that there was something given off by the barberry and some supposed it was the fragrance of the blossoms or possibly the pollen that spread the disease. Marshall in his "Rural Economy" written in 1781 says: "It has long been considered as one of the first vulgar errors among husbandmen that the barberry plant has a pernicious quality (or rather a mysterious power) of blighting wheat which grows near it." Here is

another observation made in England more than a century ago; "The part (of the grain field) affected resembled the tail of a comet, the bush itself representing the nucleus, on one side of which the sensible effect reached about twelve yards, the tail pointing towards the south-west so that probably the effect took place during a north-east wind."

It was in 1805 that Sir Joseph Banks in his paper upon "Wheat Mildew," in considering the relationship above mentioned, believed by farmers but discredited by botanists, wrote as follows: "It is not more than possible that the parasitic fungus of the barberry and that of wheat are one and the same species, and that the seed is transferred from the barberry to the wheat."

A Danish schoolmaster, Schoeler by name, holds the honor of first demonstrating the connection between the barberry rust and that upon the wheat. Schoeler's experiments began in 1807 and in 1816 he performed the following interesting work of inoculation. "Some fresh branches of the barberry bush having rusty leaves upon them were cut off, put into a box, and carried to a rye-field, where the rye was still moist with dew. The rusty barberry leaves were applied to some of the rye plants — to the straw as well as to the leaves — by rubbing them with the underside of the affected barberry leaves, until he could see some of the 'yellow dust' (spores) of the fungus adhered to the rye plants." The infected rye plants were then marked by tying them to sticks driven into the ground. In five days' time these plants were badly affected with rust, "while at the same time," says Schoeler, "Not one rusty plant could be found anywhere else in the whole rye-field."

In our present consideration of the subject we have gone far enough so that the four forms, or kinds, of spores in the life cycle of the common wheat rust (*Puccinia graminis* Pers.) need to be mentioned by their botanical names. First we find upon the wheat stubble, left standing in the field, dark streaks composed of the final spores (Teleutospores) of the previous year's production. These carry the rust fungus through the winter and germinate when the warm moist weather of spring comes, either upon the stubble or elsewhere as they may have fallen, but not necessarily upon any living host. These teleutospores produce first a slender colorless filament which soon bears a few small oval bodies into

which the protoplasm of the original brown thick-walled spore is gathered. These sporidia fall easily from their attachment and are carried far and wide by the winds. When they fall upon the young unfolding leaves of the barberry they germinate and send their slender filaments into the leaf, there to multiply, pilfer from the tissue of the host, and soon produce a thickening of the infested portion of the leaf. Shortly the epidermis upon the underside of the leaf is ruptured and a cluster of beautiful cups appears, each tiny cup being filled with orange angular spores. This is the barberry cluster cup, the old *Æcidium berberidis* Pers., of earlier botanists. By this time spring is advancing and the grain fields are reaching a period of rapid growth. The breezes whirl the dry spores out of the cups upon the barberry leaves and carry them in all directions and in countless numbers. Some will chance to fall upon the moist surface of the wheat plants, where they quickly germinate, produce infection, and, after vegetating for a brief period within the succulent tissue of the host, a genuine rust spot is produced with its multitudes of oval orange-colored spores,—the *Uredo graminis* Pers. of earlier days. This rust, so destructive to the summer grains, repeats its own form with great rapidity and for a time, depending upon the kind of climatic conditions that prevail; but with us in New England it is followed near the close of the season with the dark form of spore produced in the same rifts of the skin and forming the "weather stains" so called of the stubble with which this outline of the life cycle was begun. As this is the final form its botanical name *Puccinia graminis* Pers., is retained, and it includes the *Æcidium berberidis* Pers., and the *Uredo graminis* Pers., as forms of its own. In other words the representatives of three different genera are all brought together as forms of a single species. This Polymorphism is not very unlike the three stages of larva, pupa, and imago of the butterfly or beetle and the teleutospore stage corresponds in a measure with the final form attained by the insect.

We are now ready to consider the experiments of De Bary, the famous German botanist, who, in 1864, acting upon a popular belief of European farmers and the field inoculations of Schoeler, made a complete scientific demonstration of the unity of the species upon the wheat and the barberry. Thus he sowed the spores of the wheat rust upon the barberry and produced the cluster cup

form and the following year the converse inoculation was successfully made with the spores of the barberry rust upon the grain. De Bary's results have been reached by many others, so that today the old theory of a "noxious effluvium" exhaled by the barberry is replaced by a clearly demonstrated fact.

The working out of the double hosts among the Uredineæ has been a fascinating subject of study for thirty-five years and a long list of the rusts have their associate forms established, while every year adds new combinations, some of which are of special importance as bearing upon methods of checking the rusts of cultivated plants.

Before leaving this portion of the subject, and to illustrate the bearing of a knowledge of the polymorphism of rusts upon treatments for the same, let us glance briefly at some of the orchard rusts. There is one upon the apple that in some places is very destructive. The speaker has seen whole orchards with the foliage of a bright orange, scarcely a leaf escaping attack, and even the fruit and young twigs infested. As found upon the apple it is the stage corresponding to that of the barberry—the cluster-cup form. The teleutospore stage infests the common red cedar and there the fungus develops chocolate-colored galls a half inch or more in diameter which become large and gelatinous when the rains of spring come, and then they might possibly be mistaken at a distance for chrysanthemums of an orange color. Here we have the apple rust fungus, with a very long name, *Gymnosporangium macropus* Link., infesting two plants, namely, apple and cedar, which are as widely separated in kinship as the barberry and wheat infested by *Puccinia graminis* Pers. In the former the uredo form is unknown and probably omitted in the cycle. The round for the season with the cedar-apple rust runs as follows: The fungus exists in the winter as filaments interlaced between the abnormally large and numerous cells of the host in the brown gall. As spring comes on spores upon long stalks are produced, imbedded in a jelly that when wet swells up into the long orange gelatinous horns that project from all sides of the hard gall. These spores quickly produce germ tubes and sporidia, and the latter are carried to the young apple leaves as they are unfolding. Following the inoculation there is a discolored thickened patch produced in the leaf and several deep cups and multitudes of

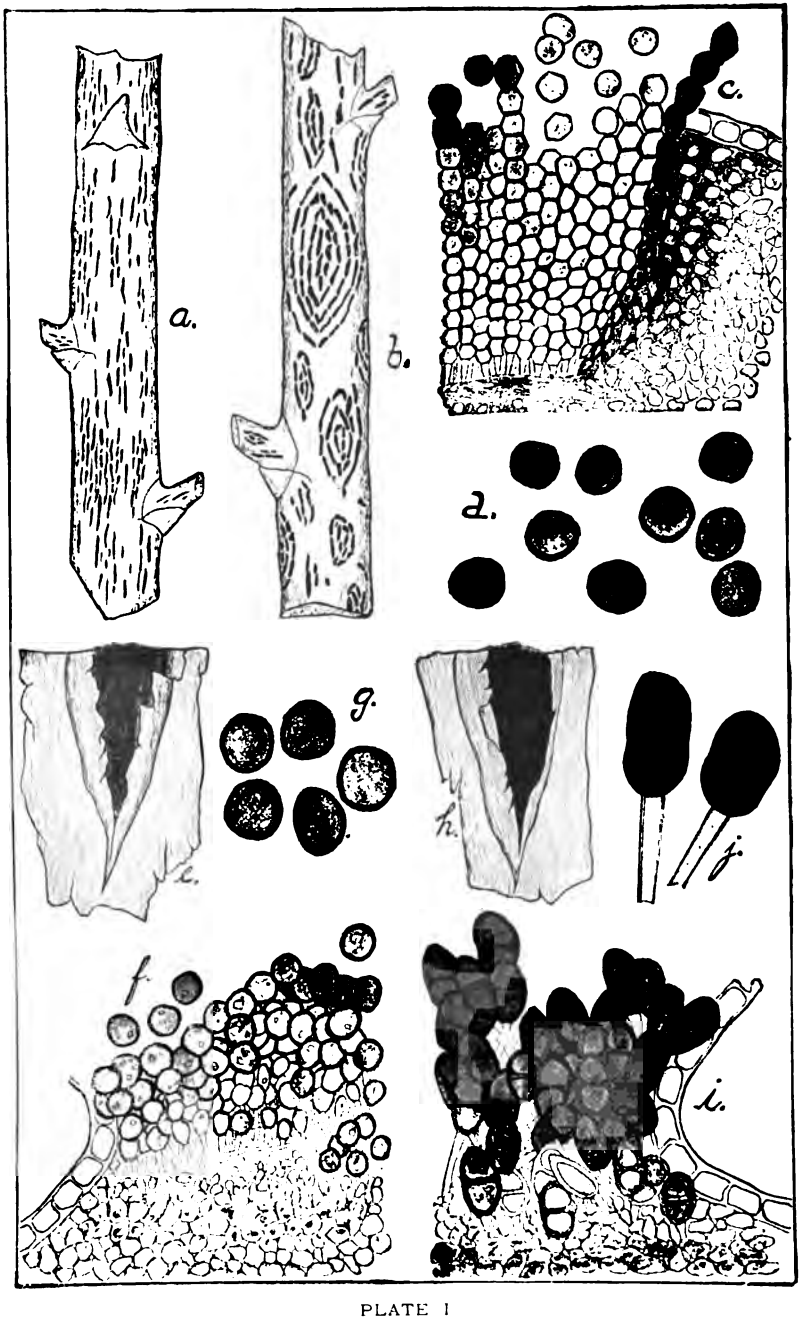

PLATE I

The Various Forms of the Asparagus Rust.

spores within. As remarked before, there is no known form in this fungus corresponding to the rust of wheat, and the spores from the apple leaf cups go to the cedar and start new galls which attain a half inch in diameter, more or less, and pass the winter as such.

The quince has a rust that is sometimes quite ruinous to the young fruits, which it distorts and dwarfs. This fungus also infests the cedars, but is easily distinguished from the common one of the apple. It is often found upon the fruit of the hawthorn and the June-berry.

Without attempting more than to give a few instances let us pass from the grain field and orchard to the vegetable garden and select one rust there for a brief consideration. That of the asparagus will perhaps be most to our interest, as it is very destructive, a new comer, and has certain points of importance not previously mentioned. Some words upon the history of this rust in America are to our purpose as showing, among other things, the rate with which a destructive fungus may be disseminated.

It was in August, 1896, that the first specimens of American grown asparagus rust came to my notice, they having been brought to the New Jersey Experiment Station with the statement that the beds from which they were gathered had ripened prematurely and the condition was alarming. A printed circular stating the nature of the trouble, with suggestions for preventive measures, was sent out to the agricultural press and the botanists and horticulturists of all other experiment stations, and from these several sources it was determined that the asparagus rust was seen that year for the first time in New England, Long Island, New Jersey, and Delaware. In 1897 it was gathered, by wide correspondence, that the rust had spread only along the Atlantic Coast, and as far south as South Carolina, where it became a genuine source of alarm in the large asparagus fields around Charleston; but as yet the vast interior and western United States were free from the rust. In 1898 the disease had spread westward as far as Michigan and southward to Georgia, with a full measure of it in Pennsylvania. During the year just closed (1899) with careful observers in each state and territory one is able to add Ohio, Indiana, Illinois, and Kansas to the infested area, and, within the past month it has been reported from North Dakota.

It is not likely that the spread of this disease has been phenomenally rapid, but on account of its first coming into the country at this late date when the Experiment Stations are established and spies, so to say, may be set upon its movements, it becomes possible to note its progress both in direction of the invasion and the rate of its advance. In order to offer some clue as to the method of the dispersion of this rust it may be interesting to mention in passing some recent personal observations in the field. For example, there were two asparagus beds standing at right angles to each other and separated by a small place containing a house and barn. In position it was like the letter T, but with the horizontal top piece somewhat removed from the upright. One bed, represented by the upright of the T, had not been cut late and was very badly rusted at the time of my inspection. The other bed had its cutting continued late for market and a young vigorous growth of brush stood about hip high. Looked at from one side all the main stems and branches were showing the rust just breaking through the skin. On the opposite side the same stems had very little of the rust in sight. The rusted side was toward the old bed and it was further observed that the sides of greatest rustiness made an arc the radii of which centered in the old bed. The observation told much, for it demonstrated that the infection was aerial and not through the roots. It showed that the old bed was the source of the contagion and that the wind was the vehicle of transfer. The asparagus plants of the later bed that stood in the line of the house were protected by it and showed much less rust, and the same was true of the barn. There was a narrow belt between the two buildings where the disease was abundant and here the spores had uninterrupted access to the young asparagus plants.

This complete demonstration of the method of inoculation leaves it easy to see how the disease may be carried for long distances by the same agency. It has been frequently observed that beds of asparagus standing alone, and surrounded by forests, are much less likely to be badly rusted than those in the full open. If the barberry-covered rocky hillsides of New England can furnish the spores to inoculate with rust all wheat fields within the sweep of New England winds, it goes without further argument that the

rust of the asparagus may have its spores carried as far as the breezes go that blow across an infected field.

The asparagus rust fungus (*Puccinia asparagi* D. C.) introduces us to a species of rust which, while having its full list of forms, namely teleuto, æcidial, and uredo stages, has them all upon the same kind of plant and therefore its spread is in no sense dependent upon any other host.

The cluster cup stage has not been at all common in America, but wherever occurring has been upon early plants in the fence row or upon uncut beds. When an ordinary plant is first attacked the genuine yellow rust is only in evidence, but shortly after in the same pustules the darker final spores are developed and in this stage the fungus hibernates.

With the wheat rust one scarcely needs to remark that a remedial measure is the destruction of the barberry bushes, or in like manner for apple rust the removal of all cedar trees near apple or quince orchards that are troubled with their respective rust. But there is no such hope in case of the rust of the asparagus.

From what has been said previously concerning the deep-seated nature of the rusts it might be expected that they are not very amenable to such treatments as prove effective with the more superficial fungi like the mildew.

The farmer, orchardist, trucker, and florist, while not proscribing spraying, need to be active along other lines as well. The consideration of the asparagus rust brings this very practical subject forward at this time. It has been the speaker's privilege to make a test of spraying upon a scale and over a sufficient period to teach him that the gain does not greatly exceed the loss. There are many sides to a question like that of spraying with fungicides. The asparagus has a different foliage from ordinary plants; in fact, the brush is made up of needle-shaped branches with a very smooth surface to which the Bordeaux mixture does not closely adhere. More than this the tips of the branches are so fine and delicate that they are burned to some extent by the ordinary mixtures.

It may be well for us here to go a step further in this matter of spraying to check the asparagus rust. The experiment began on June 16th, 1897 and after ten sprayings closed on October 5th. If we assume the rustiness of the untreated plants as one hundred it is calculated that the fungicide reduced the disease fully one

quarter. The Bordeaux mixture was applied with a knapsack sprayer and the cost per acre was $21.76 for the ten applications. In 1898 the experiment was repeated but the rust was not abundant upon the untreated plants. It was shown, however, that the fungicide materially reduced the amount of the disease, but the "brush" was somewhat injured. Similar results have been obtained for 1899 upon the same asparagus bed, the rust being reduced from sixty-six per cent to forty-nine per cent, and the conclusion seems warranted that spraying with the standard Bordeaux is not entirely satisfactory.

The bed under experimentation consists chiefly of six varieties of asparagus, namely Barr's Mammoth, Elmira, Columbian White, Palmetto, Conover's Colossal, and Giant Brunswick with a little of Moore's Cross-bred and Giant Argenteuil; the latter are younger plants and not fully comparable with the others. During the first year it was strikingly evident that the single rows of Palmetto as they stood with other sorts upon either side were the least rusted of all. This fact has been observed during all the three years that we have had the rust, not only in the experiment grounds, but in all parts of the State where the Palmetto is grown. In fact, to my mind, the chief information of value in connection with the study of the asparagus rust in New Jersey has been the determination of the greater resistance of the Palmetto, and also of a "French stock" grown as yet only to a very limited extent.

Two years ago the asparagus growers were very much discouraged and a large fraction of the beds in the State were abandoned or torn out, but the determination of the resistant qualities of the Palmetto has effected a change and now new beds are being set in large numbers — in fact, to the full extent of the Palmetto stock, no other being used excepting the "French" variety. In short the advent of the rust has not been so harmful as was at first feared, for the threatening enemy has led to a more careful consideration of their fields by the better growers, while the careless have in many cases turned their attention to less exacting crops. Growers are noting the good effect of clean, high culture upon the vigor of the plants and are using considerable quantities of commercial fertilizers, particularly nitrate of soda, to produce a strong growth of top that insures a crop when the absence of it might

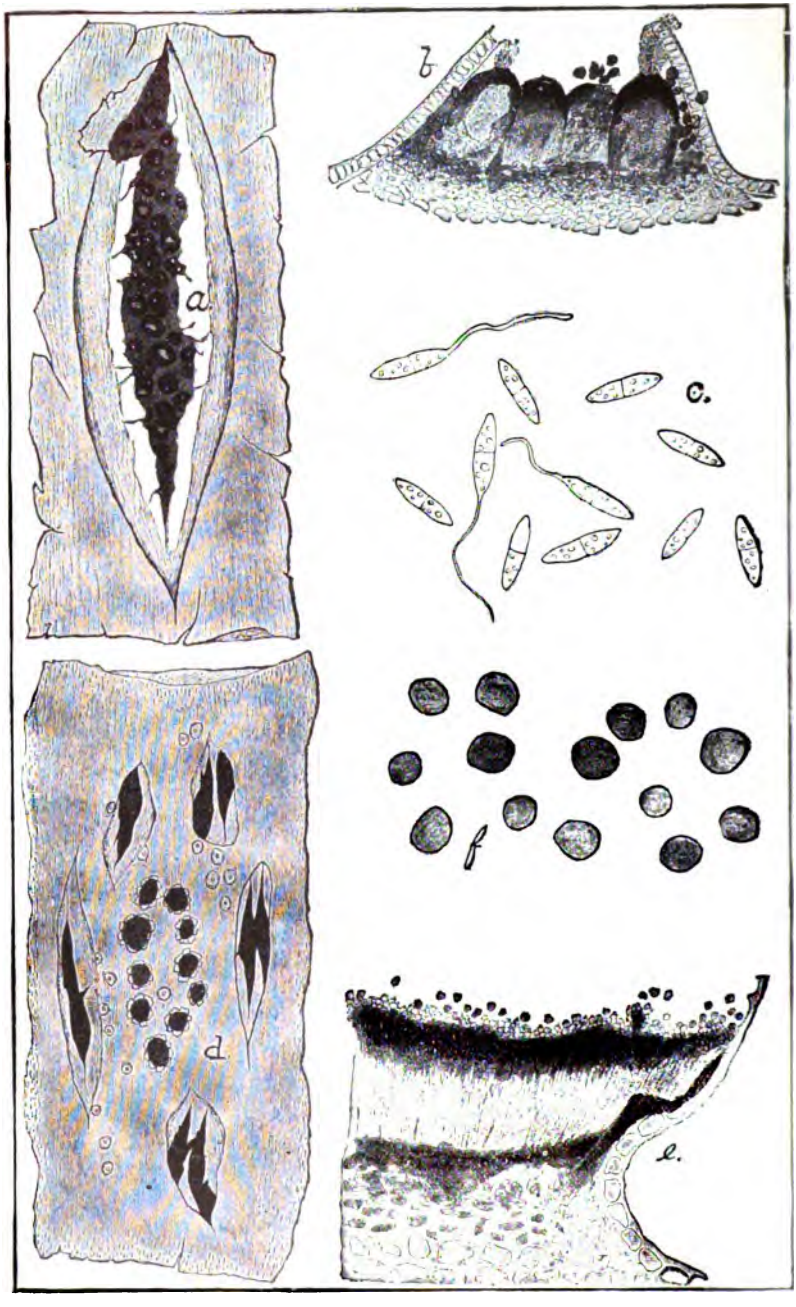

PLATE II.

Natural Enemies of the Asparagus Rust.

result in a failure. Asparagus growers are working for a more vigorous, but a shorter life of the bed and a better rational treatment generally.

There is a hope of a natural enemy coming upon the rusts and checking them. There are insects that feed freely upon the spores and sometimes clean out the minute pustules of their dusty spores. Certain species of fungi are parasitic upon the rusts, and in the study of the asparagus rust two were met with, one of which (*Darluca filum* Cast.) was so abundant as to make it possible that it will prove a material check to its fungous host and possibly remove any anxiety connected with the ravages of the rust.

The recommendation to burn the rusted brush in autumn as soon as it loses its deep green color has been heeded by many with varying results, some claiming that it was an advantage, while others consider it of little use. Theoretically it is the proper thing to do, as it removes the brush after it is no longer of any particular value in making food for the new spring shoots, and the myriads of spores are thereby destroyed before they spread the disease, as they would be quite apt to do the coming spring.

Please observe the language used —"quite apt"— for there is a lack of certainty in it all. With rusts as with fungi generally the surrounding conditions play so very important a role that one cannot predict an outbreak simply because the spores are at hand.

This subject of favoring circumstances may come up later, and here let us consider one or two rusts that trouble the florist. To go into the field and talk of the grain rust, into the orchard and consider the apple rust, and into the vegetable field and speak of the asparagus rust, and omit the flower garden and greenhouse would be showing a partiality not at all in keeping with the composition of this audience and the venerable Society it represents.

There are at least three rusts that have made themselves prominent among ornamental plants during the past few years. A leading trouble in the flower garden is the Hollyhock Rust (*Puccinia malvacearum* Mont.) which came into this country from Chili in 1890, and spread with remarkable rapidity and fatality. It develops upon all portions of the hollyhocks, as the leaves, stem, and floral parts, causing them all to sicken and die. This rust is

a good illustration of those that have only the teleuto form of the spore and the sporidia that grow directly from it. In other words the cluster cup and uredo stages are omitted and the first state becomes the last, so far as spore development upon the host is concerned. The great rate at which the fungus spreads is to be accounted for largely because it hibernates as the living mycelium in the hollyhock, the young leaves of which exist as a rosette through the winter. As the warm moist weather comes the orange patches upon the foliage enlarge and quickly develop spores that almost at once form the sporidia which rapidly spread the rust to other parts of the hollyhock. There is no resting period in the teleutospore condition, which is reason enough for a rapid propagation of the rust, but when added to this is the absence of two stages in the life cycle there is no wonder that when a hollyhock is once affected the doomed plant is quickly ruined provided that the conditions are favorable. This last clause is one of no small consequence, and this rust becomes a good illustration of a general fact that unless warmth and moisture as well as spores abound the rust will not thrive. It is not unusual to find the upper surface of a leaf stalk rusted some days in advance of the lower side, due to the dropping there of spores from a diseased leaf above. This observation brings out the idea that water is one of the common carriers of rust spores and that it furnishes the requisite moisture for their germination.

Another observation that may be made in connection with the hollyhock rust is its scarcity at certain times. For example, in 1898 there was an abundance of hollyhock rust, while a year later there was almost none upon plants badly rusted the year before. It may be said in explanation that the conditions were unfavorable for the disease and the health of the plants was restored. Good growing weather with no excess of moisture is the best ally of the victim, and if it comes in time many kinds of plants will recover from an attack that might otherwise be disastrous.

Another new fungous enemy that has troubled the American florists seriously is that of the Carnation Rust (*Uromyces Caryophyllinus* Schr.) which reached us, probably from Europe in imported stock, in 1891 and is still in evidence in nearly all parts of the country. The fact that this rust grows upon a prominent commercial floral plant makes it worthy of a word in passing. The

conditions here are quite different from those in the open garden, for heat and moisture and a more or less confined air quite constantly obtain in the greenhouse, thus supplying the surroundings favorable for the growth and spread of the rust. The spray from the hose in watering, for example, is one of the best means of carrying the spores from a diseased to a healthy plant.

The experiments that have been made with this disease are somewhat limited, but they go to show that preventive measures are better than attempted cures. From the fact that the carnation is largely an indoor plant and propagated by cuttings it goes without saying that the stock should be healthy from which the cuttings are taken, and no rusted plants should be introduced into a house previously free from the rust. One rusted plant, under the circumstances of greenhouse growth, may be ample to inoculate a whole bed, and this accounts for the sudden outbreak of the rust in houses hundreds or thousands of miles apart. The rusted stock of some commercial house may go into a dozen widely separated states in the Union and all carry the disease. In this case one does not need to charge the transfer to the winds, and the importance of great carefulness in purchase and in propagation goes without saying. These and various sanitary precautions are now becoming understood by florists. The destructive virus with this rust as with others is the brown dust upon the rusted leaf, and every precaution should be taken to prevent its formation and to effect its immediate destruction if it does appear. Carnation growers are gradually acquiring a knowledge of the susceptibility of varieties and are finding some sorts in this respect much more valuable than others.

The latest claimant for our attention among the greenhouse rusts is that of the chrysanthemum. As yet the advent of this importation from Europe has not been traced back of 1896, when it was found by a Mr. Hastings of Fitchburg, Mass., and reported by Dr. Stone in the Ninth Annual Report of your Experiment Station. From foreign correspondence it is gathered that it was rampant in France and then spread throughout England, where it was very destructive, particularly in 1898. With us it has increased quite rapidly during the past three years and during the last one it has become decidedly troublesome. The plants when affected remain small and the foliage is blotched with large circular

rust spots. Up to the present time only the uredo form has been met with upon American plants and therefore it is impossible to be sure of the species. While this is interesting from the standpoint of the botanist it may be of no great economic importance. However, if the other forms are associated with the dandelion, or similarly related common wild species, the bearing of this knowledge upon the checking of the rust is at once apparent.

This disease is so recent that with us there is very little in the line of remedies that has been determined experimentally. It being a greenhouse plant, propagated by cuttings, the precautionary measures are practically the same as with the carnation. The two rusts are, however, very distinct, belonging to different genera of fungi and not transmissible from one of these host plants to the other. In other words, the Daybreak carnation, so susceptible to rust, may be tolerated, in its worst diseased condition, close by the chrysanthemums without any risk of infecting the latter, or contrariwise the Golden Wedding chrysanthemum, loaded with rust, may be placed in the midst of a healthy bed of carnations without any danger of introducing the rust to the pinks.

In the treatment of our subject we have made a few selections of typical rusts from widely separated host plants, and have endeavored to bring before the hearers some of the more important points connected with one of the leading groups of destructive fungi.

We have seen that the rusts infest herbs, shrubs, and trees. The forests are not exempt from them and even the giant pines are destroyed by rusts. May I be permitted to say that only last summer I saw in British Columbia almost endless amounts of a rust (*Chrysomyxa Ledi* Alb. & Sacs.) upon *Ledum Grœnlandicum* Oeder, and associated with it were great "witches' brooms" or "crows' nests" in the fir trees (*Abies balsamea* L.), caused by a form of the Ledum rust. Here, in an almost untrodden wilderness, where for half the year all is shrouded in snow and ice, this very destructive rust had established itself long centuries ago, and the human mind is left to speculate as to the precise reason why this particular association of fungus and its two hosts had been perfected. If we could answer for this instance in the wilderness, the clue would doubtless be found for combinations between wheat and barberry, the apple and cedar, and the many other known associa-

tions, to say nothing of the greater number whose life cycles have not been even studied.

From the instance of the "witches' broom" above mentioned it is evident that the rusts may not only greatly distort the host, but are often perennial when upon plants that live on through the years. Similar "crows' nests" are to be met with in our own cedar trees, and these are due to rusts that live in other forms upon various forest and orchard trees. This perennial nature of the rusts has its very practical bearing upon their destruction when upon cultivated plants. The blackberry and raspberry rust is one of the most serious pests to growers of bush fruits. It shows itself in early spring, dwarfing the cane and ruining the foliage. When such an infected plant is cut to the ground the new shoots, springing from the stock, will also become rusted like the first growth of the year. Actual microscopic examination of the tissue of the root demonstrates the presence of the perennial mycelium. With these facts before us it is not strange that the multitudes of experiments made to eradicate the disease by spraying the plants result in failure. The Bordeaux or other mixture when upon healthy plants may help to prevent the spread of the disease; but when once within the tissue of root and stem it is out of reach of spraying compounds. It goes without any argument that all such rusted plants need to be dug up and destroyed root and branch, and the earlier this is done the less likelihood there will be of the infection spreading by means of the spores. The burn heap is one of the best adjuncts of a well equipped horticultural establishment. It excels greatly the rubbish pile. Ashes may be blown about by the winds and no serious inoculations follow from them.

The "seed-treatment," so called, for the prevention of diseases in grain fields, while of great value with the smuts is not effective with the rusts, and for reasons that are not far to seek. The oat or wheat smut spores are produced in the grain itself and healthy grains become smeared and dusted with the spores. The smut fungus infests the grain plant when it is a small seedling and at or near the surface of the ground. When this young stage is past the plant is exempt. The adhering spores are therefore well situated to inoculate the seedling as it unfolds.

On the other hand the rust is not produced in the grains, and infests the plant directly through the leaves and by means of

spores that come to them in the winds directly from some diseased plant. The only way to check the rust by treatment with a fungicide is to spray the plants bodily when the spores are ready to alight and produce infection, or the plants that are furnishing the virus, or both. This treatment is not considered practicable for field culture and is usually not very effective in the orchard or fruit garden. The spraying for the rust upon stone fruits (prunes) in California is somewhat exceptional.

No treatment of the seed, the soil, or even the growing plant itself can be generally relied upon, and consequently while not discarding the spray pumps other means should be considered.

With out-of-door plants but little can be done to modify the conditions under which the rusts flourish. Certain seasons will provide the humidity and warmth at just the right time to induce infection while others may furnish the opposite and the crop is comparatively exempt. Until the weather is under man's control we may not hope to be rid of the army of rusts that prey upon our crops. The question is somewhat different with the greenhouse where heat and moisture are more within man's hands. But even here the conditions that favor the most profitable growth of the desired product are the ones that conduce to the spread and propagation of the diseases of the same. However, there is much in the way that the house is ventilated and the water applied that will help to keep down the rusts. We all know that close attention to all the minor details of health for the plants will go far towards success in the face of contagious diseases to which the plants may have been exposed.

There still remains the resort to varieties that are least susceptible. The importance of this has been shown in a practical way in the body of this paper when considering the rust of the asparagus. The Palmetto variety is so far ahead of the ordinary sorts, probably due to a greater deposit of wax upon the surface of the stems, that it is already accepted as the best variety to be set. Time may show us the way to rust-resistant grains — already talked of but doubtfully obtained—and to orchard trees and bushes that are rust proof. They may come by observations, for it is a well established fact that there are great differences,— or by the breeding in of a blood that will bring exemption. So long as differences of susceptibility to rusts exist in plants capable of

breeding there remains the grand possibility of vanquishing the enemy by fortifications made by the hybridizer's art.

As previously mentioned there is hope that natural enemies may assist the crop grower.

The last resort in all cases when rust is suspected is to furnish the best possible conditions for growth of the crop, bearing in mind that vigilance is especially demanded when the foe is at hand. Any neglect — as lack of light, air, food, or water, or a surplus of the same — may engender a weakness that will cause the plants to fall a victim at the first opportunity.

As when some contagious disease has invaded the human dwelling and is followed by a thorough cleansing of the rooms, even to a change of carpets, and paper upon the walls, so when there is an outbreak of a rust in a plant-house there needs to be a renovation as thorough, because the germs are as insidious and lasting. In connection with the subject that has been considered at the present hour there is no point that is made with greater earnestness than that which is covered by the word sanitation. In this closing year of the nineteenth century we have come to such a full knowledge of the germ diseases that, whether in city, camp, or college, we are willing to comply with the rules of the boards of health even when they exact of us seeming infringements upon our old-time rights.

We must carry the same idea into the commercial greenhouse and orchard and the public garden. If we would have healthy plants the germs of disease must be kept out, or if once introduced they need to be speedily exterminated.

We admire perfect health in the robust and rosy youth; and the contrast between sickly plants and those in the full vigor of fruitage is entirely in favor of the latter. A short time ago I visited two chrysanthemum greenhouses only a mile apart; and one was filled with rusted plants without a fair-sized bloom or the possibility of one, while the other had not a sign of the rust and the plants and blooms were wonderfully fine. Purposely some days intervened between the visits that my skirts might be clean of the possible charge, upon my own conscience at least, of carrying the germs of the disease into the house where they were not before. The owner of the rusted stock introduced the infection in a few plants from a neighboring city and will destroy his present entire

stock, cleanse the houses even to the removal of his gravel paths, fumigate for the germs lodged in the crevices of the structure, and start again with stock that he is reasonably certain is free from rust. It may be that fewer precautions would suffice, but the ruin was so complete that humiliation has blossomed into heroic resolutions and no quarter will be given the rust-brown foe.

This is a case where no reasonable amount of attention might have averted the calamity. Possibly if the rust had been observed as it first came to sight, and the introduced plants destroyed, the result might have been different, but this is too much to ask of mortal gardeners. However, a plea is made for an observance of rules of sanitation with plants subject to contagious diseases, that is, in some measure, comparable with that demanded of the human subject and his domesticated animals.

Description of Plates of Asparagus Rust.

Plate I.

Fig. *a*. An asparagus stem showing Uredo form of the rust; natural size.

Fig. *b*. An asparagus stem showing Teleutospore form of the rust; natural size.

Fig. *c*. A portion of a section of an Æcidium cup showing the rows of spores and the Mycelium of the fungus and cells of the asparagus stem; magnified 175 times.

Fig. *d*. Æcidial spores; magnified 300 times.

Fig. *e*. Portion of Uredo sorus; magnified 25 times.

Fig. *f*. Portion of a section of a Uredo sorus; magnified 175 times.

Fig. *g*. Uredo spores; magnified 300 times.

Fig. *h*. Portion of teleutospore sorus; magnified 25 times.

Fig. *i*. Portion of a section of teleutospore sorus; magnified 175 times.

Fig. *j*. Two teleutospores; magnified 300 times.

Plate II.

Fig. *a*. A Uredo sorus infested by the Darluca; magnified 25 times.

Fig. *b*. A section of Uredo sorus infested by the Darluca; magnified 70 times.

Fig. *c*. Spores of the Darluca — three of them germinated; magnified 590 times.

Fig. *d*. A cluster of Æcidium cups infested by the Tuberculina— the cups are in the center and the Tuberculina marginal near the spermagonia; magnified 15 times.

Fig. *e*. Portion of a section of the Tuberculina; magnified 175 times.

Fig. *f*. Spores of the Tuberculina; magnified 590 times.

Discussion.

Thomas Harrison asked whether there is any possibility of transmitting these rusts by mulching. He had lost more after covering than before. He had a small bed of Downer's Prolific strawberries which was much injured by rust, and asked if this could have been caused by the oak and other leaves used for covering.

Professor Halsted replied that the winter form of spore does not require any living plant, but in the case cited, or in the strawberry rust there would be no harm in covering with oak leaves or pine needles.

Samuel H. Warren said that the William Belt and Hunn strawberries are troubled with rust almost everywhere. The Clyde is a stronger variety, and is free from rust even when growing within two feet of those most badly affected. Most applications to prevent rust must be made before the rust shows.

Professor Halsted said that when the fungus is once within the tissue of blackberry and other plants, spraying is ineffectual. Strong, vigorous strawberry plants are less susceptible than weaker ones, and it is important to keep plants in good heart.

In answer to an inquiry he said that in a chrysanthemum house, where there were almost twenty-five varieties, only one was to any extent proof against rust. This was Inter Ocean, which was about half proof.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, January 20, 1900.

A meeting for Lecture and Discussion was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

The following lecture was delivered:

A HALF-CENTURY'S EXPERIENCE WITH ORNAMENTAL TREE PLANTING.

By O. B. HADWEN, Worcester.

It is more than half a century since I purchased some land, the major portion of which was for many years used for pasture. It was not embellished with either tree or shrub excepting a few of Nature's planting, indigenous to the soil and climate, that had escaped the woodman's axe in the early clearing. Some were even three score years and ten, and accustomed landmarks. At that period but few thought of beautifying their homes or the landscape, or enhancing the value of landed property, either immediately or prospectively, with trees. With the progress of Arboriculture in embellishing grounds, either private or public, trees can be so arranged as to form a conspicuous and enduring feature, and planting be made to grace and adorn every situation.

Tree planting is a science and art nearly as old as the hills upon which trees of Nature's planting have grown for all time, and been nurtured with the natural conditions of climate and soil suited to the great variety indigenous to all sections.

But the art of tree planting by man seems to differ with each sort. So many conditions are involved relating to soil, climate, and exposure, that there will always remain something to be learned regarding the requirements of every sort. If we could look under ground and discover the conditions which each plant requires and which are necessary for its nourishment and growth, it would be a vast help to successful tree planting. If we could measure the wind and the extreme heat and cold of all exposures we could better determine what sorts to plant and where to plant them, before time and money are wasted.

But it seems to require a lifetime to discover the most favorable conditions, for each and every sort, as every tree, either deciduous or evergreen, seems to differ in the treatment most suitable for its habit, in its soil, exposure, space, pruning, and general treatment. Some trees refuse to grow near other kinds, and will lean from them. The exudations from the roots of some are apparently detrimental to the growth of others.

There is a natural, and at the same time a mysterious force which seems to govern the development of each tree or plant, and directs each tree to procure its sustenance by the inherent forces of both root and top, and these mysterious and natural forces seem to be the governing principle with each and every plant, all differing to a greater or less extent, as is apparent to the grower but cannot be explained.

The past fifty years have wrought a wonderful change in ornamental tree planting. The increasing taste has kept even pace with the increased variety, both of indigenous and exotic trees. Fifty years ago the value of tree planting to rural homes or ornamental scenery was but beginning to be understood, and the kinds used for ornamental planting were largely the Elm and the Maple.

The importance of trees to rural taste and comfort was almost entirely overlooked. Their influence upon climate and upon the landscape had not enlisted the time or the attention of citizens generally. The affirmation of their value in ornamental scenery, now so apparent, and sought for, has come by slow but sure advancement, and the selection of those which add so much by their stateliness, grandeur, and picturesque beauty and elegance: by gracefulness of form, both of branches and foliage, the brilliancy of the varied tints of autumn, and the beauty and fragrance of their flowers combined, have proved strong inducements to tree planting.

With the progress of arboreal planting and natural as well as cultivated taste in embellishing grounds, both public and private, trees termed ornamental can be made to form a conspicuous feature in the suburbs of towns and cities on farms and roadsides. Trees also exert a most decided influence upon the climate: they break the force of gales of wind; they tend to maintain an equability in the temperature, modifying the intensity of extreme

heat or cold. The variety at our command increases every season, and since the Arnold Arboretum was established trees and plants come to us from every country of the temperate zone.

But my farm is only a plain Massachusetts farm, where no attempt is made at the higher order of embellishment, but where more than a hundred different kinds of ornamental trees, and nearly if not quite a thousand individual trees have been planted to test their habits of growth and hardiness and improve the farm landscape. Some of them have already contributed to the construction of farm buildings, while others have been made into household furniture, and a plenty yet remain of ample size and dimensions, suitable for any purpose for which wood or lumber is used. These trees have been planted with my own hands, have been nurtured under my care and supervision, and some of them will outlive generations of men, and remain prominent landmarks as time goes on. The farm is about six hundred feet above tide water.

The better time to plant trees, either spring or autumn, is a question on which there is a wide difference of opinion. Having planted many trees at both seasons with good success, I have come to the conclusion that when climatic and other conditions which should be duly considered by the planter are favorable, the autumn is a propitious season for planting either deciduous or coniferous trees, provided it is accomplished early, when the ground is warm, and root growth is thereby encouraged. For planting deciduous trees, early in October is the better time. The foliage should be removed; the leaves will then cease to draw upon the roots for nourishment, leaving them in condition to make new growth, which they readily do when the ground is warm, and sufficiently moist. Both heat and moisture are essential to promote root growth at any season. In the spring, conditions are changed; the atmosphere is warm and the ground is cold, and while the leaves will start the roots remain dormant, and cannot promptly supply the nourishment required by the top.

Coniferous trees may be planted early in the month of September with advantage, provided the ground is kept moist to insure root growth. When these conditions can be carried out, autumn planting proves of decided advantage. If trees are to be transported long distances spring planting has some advantages. Even spring planting is facilitated by the holes being dug in the autumn; the

action of the frost upon the earth renders it more friable and more easily incorporated among the roots. Thoroughness in filling the spaces among the roots is of essential importance to successful tree planting.

The constantly increasing variety of Ornamental Trees that thrive in the central part of the state is so large that I can but briefly allude to even the most prominent — those that are approved by long experience, and those of newer sorts that promise well. Many trees that were considered but half hardy years ago have seemingly become acclimated, and now withstand our extremes of temperature, adding very much to the landscape in their variety and effect. Of the hardy sorts there are quite enough properly to embellish rural homes with a most agreeable and pleasing variety.

The Maples (*Acer*) have been for a long time and are now prominent in their variety and conspicuous both in landscape and streets — a favorite tree which well repays the attention it receives.

I have growing more than twenty sorts; most prominent are the Sugar, Norway, Schwedleri, Reitenbachi, Geneva, Wier's Cut Leaved, Sycamore, and Purple Leaved, Tataricum, Ginnale, Pennsylvanicum, Negundo, and the Japanese Maples and others which I will omit to mention. In fact the whole family is one of great beauty, and its members are in the front rank of deciduous trees; as ornamental trees some of them will fit any soil or situation. I have many large trees planted near the streets and roads which give abundance of shade and are the glory of the autumn.

The Magnolias are among the most magnificent trees for ornamental planting. Fifty years ago but few were considered hardy. The varied forms of the trees, with the size and verdure of their foliage and the beauty and fragrance of their flowers, place them in the front as ornamental trees where the soil and exposure prove favorable. I have some fifteen varieties, all proving hardy save one. They are *M. acuminata*, *M. glauca*, *M. macrophylla*, *M. tripetala*, *M. Alexandrina*, *M. conspicua*, *M. Kobus*, *M. Lennei*, *M. purpurea*, *M. parviflora*, *M. hypoleuca*, *M. Soulangiana*, *M. speciosa*, *M. stellata*, and *M. Thomsoniana*. Some of these trees are thirty feet high and their season of flowering

covers two months, and the foliage in its variety is fully as interesting as the flowers.

The Tulip tree is proving a great favorite on extensive grounds, and being of rapid growth soon becomes a stately tree. I have one less than forty years planted now over eighty feet high. The flowers, which are abundant and open in June, are of fine tulip shape, of greenish-yellow tint. The only objection is its liability to break in severe storms of ice, but with its rapid growth it soon recovers its form. Its lumber is known as whitewood, now so extensively used in inside finish. It is one of the noblest trees in good soil. It is a difficult tree to transplant unless quite small, but when once established and well nourished it well repays the care given to it. It should be transplanted in spring. Nurserymen have got into the way of growing tulip trees with planks underneath, so as to prevent them from sending down tap roots.

The Beech (*Fagus*) in its variety forms a class of ornamental trees worthy of more elaborate consideration than time will permit. The American Beech, found growing over our northern regions, is much esteemed for its neat and airy foliage which remains on the branches during the winter. When planted in groups with other beeches they give a pleasing variety, both summer and winter. There are no trees that withstand ice storms with less injury. The Fern-Leaved beech is perhaps the most shapely in its growth of any of the family. I have several, one of which is thirty feet high and thirty feet in spread and without question the most beautiful and symmetrical tree in my collection. The foliage is finely cut and very dense, making it a marked tree in any collection.

All the Birches are graceful trees; they have a graceful sweep and peculiar flutter in the breeze. Many are indigenous to New England, and thrive in northern latitudes. The most common are the Gray, Black, Yellow, Red, Purple, Canoe, and the Cut-Leaved Birches.

The Canoe birch attains the largest size. I have one forty feet high and two feet in diameter. The Cut-Leaved birches also attain large size and are perhaps the most beautiful of the family. They should not be planted near the house as they continue to shed both leaf and flower for a long time.

The Sweet Gum Tree, (*Liquidambar styraciflua*) now being

considerably planted, is not, so far as I can learn, indigenous to the New England States but seems to thrive here where the situation is favorable. In the Southern and some of the Western States it grows to a large size. My trees of this variety are twenty feet in height, finely formed and of shapely growth. As an ornamental tree it has few equals, the exquisite gloss of the foliage in the summer, changing with varying autumn tints to a beautiful bronze, and the exquisite form of the leaves, combine to give it a distinctive character and to render it an ornamental tree of the first class.

The *Virgilia lutea* or Yellow-Wood ranks among the finest of ornamental trees, with graceful foliage and clusters or racemes of white flowers in June. It forms a shapely head and grows freely in good ground. It is especially adapted to moderate sized grounds where but few trees are grown, but it is an admirable tree in any collection.

Many species of the Oak (*Quercus*) are indigenous. I have some of Nature's planting four feet in diameter and sixty feet spread of limbs. They too rarely adorn private grounds, being difficult to transplant. When planted they should be young and pruned to the pole. When the Oak is given ample space to develop and time to mature, but few trees can be compared to it in its variety of beauty changing with the seasons from the delicate form and color of the opening leaf, to the deep and glossy green of the summer and the gorgeous colored tints of the autumn.

The Walnut (*Juglans*) is readily grown from seed and transplanted when young, or when large with a frozen ball of earth. There are several sorts that are desirable both as nut and ornamental trees.

The Black Walnut makes a fine vigorous tree; tall, with a spreading habit; its leaves are long, swaying gracefully in the breeze. The black walnut from Japan seems very much like ours both in leaf and fruit: there is one from Japan producing fruit in clusters.

The Hickory (*Carya*) makes a stately tree and is long-lived, bearing nuts which are esteemed. The Shellbark with its luxuriant leaves and shaggy bark has a distinct habit differing from other trees. Its fruit is abundant, of delicate flavor and prominent in the markets.

The American Linden or Bass (*Tilia Americana*) is coming to be esteemed a popular ornamental tree, by far superior to the European sorts. It surpasses all others in size and foliage and the abundance of its flowers, whose fragrance fills the atmosphere. I have some more than eighty feet in height, and very stately trees.

There are many other deciduous trees growing on my farm, well worthy of planting, which I can only attempt to designate by name. Among these are the Mountain Ash, Oak-Leaved Ash, *Catalpa speciosa*, Double Flowering Horse Chestnut, Kentucky Coffee tree, Ginkgo, Koelreuteria, *Aralia spinosa*, Cercidiphyllum, Tupelo; Poplars — Bolleana, Carolina, and Lombardy; *Sophora Japonica*, Sassafras, *Syringa Japonica;* Elms — American, English, and Scotch; and the Nettle tree *(Celtis)*.

Coniferous trees, for their symmetry of form and varying shades of everlasting green, and the beauty and grandeur of individual trees are enlisting increasing attention. My first planting of the White Pine (*Pinus Strobus*) was in 1846. They were planted more with the purpose of shelter than for ornamental effect, and for the first thirty years they furnished both, but in later years they have been much broken by storms and ice, and now, while they would furnish good saw logs, they are not very ornamental. I early planted the Scotch and Austrian pines and both proved inferior to the white pine. The Swiss pine (*Pinus Cembra*) proves the best of the pines, retaining its symmetry of form and its beautiful shade of green. It is well furnished with branches, which are of tougher fibre than others, and resist the storms of ice.

The Norway Spruce, now so well known, was a favorite tree. I planted them quite extensively and they have attained a height of from sixty to eighty feet and are prominent in the landscape. They form a splendid pyramidal head and the branches are flexible and remain unbroken even in old age.

The Silver Fir has proved a rapid grower after the first few years; the foliage is conspicuous with its shiny green and silver lines. It attains a height of sixty feet.

The Oriental Spruce is a charming tree, differing from the other spruces in its compact form and short, dark, and attractive foliage.

The Hemlock Spruce, indigenous to the New England States, is perhaps the best of the coniferous trees. I have some planted thirty-five years, which now are fifty feet high. When standing alone it forms a shapely and graceful tree; the marked and distinct contrast in color of the new and old foliage is always pleasing, and when it is covered with light snow it forms an object of beauty unequalled in winter scenery. It withstands the storms of ice, for its branches are so flexible they rarely break. For this climate it may be justly called the queen of the evergreens.

The White Spruce is the most shapely of the spruces, with its light green leaf, sometimes shading to blue. Its compact form and slow growth render it adapted to small areas where primness is desired.

The *Picea pungens*, a Colorado blue spruce (sometimes green), is proving an attractive and desirable sort. I have some thirty feet high and they form fine pyramidal trees, many with a bluish silver sheen. The foliage is stiff and strong and they seem especially adapted to high altitudes, and withstand the force of the winds uninjured.

The *Abies concolor* is proving one of the most attractive evergreens, being of fine symmetry. The foliage is very long, with a silvery sheen. They thrive in the higher grounds, and should be transplanted when small, or with a ball adhering to the roots. I will only designate by name the other conifers that I have growing on my premises.

Abies Veitchii from Japan makes a beautiful tree; *A. Douglasii*, *Picea Alcoquiana* from Japan; *Picea Engelmanni*, *P. Nordmanniana*, *P. Omorika*, and *P. Fraseri* are the most prominent. Then there are Arbor Vitæs and Junipers, of both of which there are a number of desirable and pleasing sorts from China and Japan, and new ones grown from seeds are adding to the number every year.

The increasing importance to residential grounds, of evergreen trees combining both shade and shelter is manifest every season. The comparatively new varieties also are adding interest every season to the charm of homesteads and landscapes.

The earlier tree planting was not pursued so much with a view to landscape effect as to give shelter to buildings and orchards and fields with northerly slopes, from fierce winds. Those indigenous were commonly used; exotics were few and looked upon with

doubtful forebodings and were regarded as more experimental than practical. But time has changed tree planting; with later years exotics are sought for the variety and novelty they furnish, together with the pleasing effect of both trees and leaves. A tree must break the force of the wind, must drink of the dew and the moisture of the earth, must eat of the food that will nourish and strengthen its fibre, and lives and grows in accordance with,—is it instinct or knowledge? I know not.

In tree planting no one rule can be applied to all kinds, but general rules are essential to success. In early life I made many mistakes; then I had not learned the importance of digging generous holes, deep in well drained land, and shallow in wet places. I have learned to use an adequate supply of well composted material about the roots, and also have learned that an annual dressing should be applied to produce the finest effect both in tree and leaf, as years roll on. The marvelous instincts of tree roots, where they run long distances in quest of food and moisture, are unexplainable; what forces direct them is far beyond my comprehension. I often see in the roots conditions I am powerless to explain. Roots seem to seek their food and drink with the same knowledge that man and animals seek them, and when a tree suffers from want either of food or drink, the roots will make the most strenuous exertions to sustain the trunk and foliage. By what power do trees select, each its distinct form, each its distinct leaf, which is endowed with distinct shades of color, which with their marvelous tints and unnumbered forms must ever remain surprising to all lovers of trees, Nature's most wondrous plants.

But we now enjoy greater advantages in tree planting than ever before in our time. There are gentlemen within this Commonwealth and members of this Society, who have devoted long lives to the embellishment of fine estates, and have planted them with every variety of deciduous and evergreen trees which will thrive here. These trees receive every care to promote symmetry of form and perfection that science and art and common sense can contribute.

Many of these finely embellished estates are open to lovers of trees and are veritable object lessons in an arboreal or horticultural sense, diffusing arboreal knowledge to the present and coming generations and the owners are justly esteemed great public benefactors.

Discussion.

Ex-President William C. Strong said he had been much interested in the lecture, as had all who heard it, and spoke of the Ailanthus, which the lecturer had omitted to mention. He was very much surprised and delighted with a group of *Ailanthus glandulosa* planted on the slope of Wissahickon Heights, at Philadelphia. The trees were loaded with large clusters of fruit. The disagreeable odor when in blossom early in the season has made this tree objectionable. It used to be common in Brooklyn. The lecturer, he said, had spoken of the maple as one of the first, as an ornamental tree. It is the first when we consider all the species. The speaker wished to protest against the universal use of the Rock Maple. He considered it too formal and as making too dense a shade for the street. Schwedler's maple, first imported by him some time in the seventies, he thought a very ornamental tree. He imported it as a pot plant and was so delighted with it that he repeated his order for a pot plant at five dollars. He recommended the Wier's Cut-Leaved Weeping maple although it is slender and likely to be broken by ice. It is a light airy tree and very graceful. It ranks with the elm, and he considers it very desirable for street planting.

Jacob W. Manning had known Mr. Wier, who introduced this tree. The finest specimens that he had ever seen are at Arlington Heights. The call for oaks to plant in parks, the speaker said, is increasing. He thought he had done more than anyone else to make the White Spruce popular. It retains its lower limbs and he thinks it one of the best of evergreens. He had seen the Blue Rocky Mountain Spruce in the Platte Valley five feet in diameter and fifty feet in spread, and with cones five inches long. Only a small part of the trees are blue.

Mr. Manning spoke of the fall of the Batchelder pine in North Reading, in December, 1899. It was dead excepting one limb which rose to the height of one hundred and twelve feet. The diameter of the log at the butt was ten feet, but there was three feet of rotten wood inside. At fifty feet high it was nine feet in circumference. It was probably two hundred years old. He first saw it fifty-two years ago. It was broken by ice in 1886.

Ex-President William H. Spooner wanted to caution people

against planting the elm. He had suffered all kinds of torments from some on his street. He had found his drain filled solid with their roots. He spoke of the terrible methods of the electric companies, who come along and saw off limbs with no regard for the effect on the beauty of the tree. The City Forester, he said, takes no pains to protect the trees. He asked Mr. Hadwen for a little information as to the best tree to plant on the seashore,—something tough enough to stand our winds. Beyond Tremont on Cape Cod the White pine is not hardy; the Scotch and Austrian pines do better.

Mr. Hadwen said that in Nantucket they plant the Yellow pine. He favors planting street trees inside of premises; the owners can then control them. He has planted many trees in the streets of Worcester and has come to the conclusion that it is not best to plant in the business portion of the city. If sidewalks were ten feet wide it might do to plant on the edge of the sidewalk.

Benjamin P. Ware spoke of the modesty of the lecturer, who had called his farm a plain Massachusetts farm where no attempt had been made at adornment, yet he did not know of any private grounds more beautifully ornamented.

Mr. Ware had planted many trees and found the Sycamore Leaved maple very desirable. The Norway maple also is desirable but care should be taken in pruning as it is likely to split. He has the Norway pine growing very successfully directly on the seashore. He finds the Red cedars indigenous there, and has been interested in watching the different forms taken by them,—some straggling, and some as upright as Lombardy Poplars. Mr. Ware said that the elm had always been considered a pretty good tree, and wondered what they would say in New Haven if they were to hear it condemned. He recalled Lafayette Street in Salem with its magnificent elms on either side meeting overhead, the branches so high that the electric wires are underneath. He spoke of a magnificent White oak on the Treadwell Farm in Topsfield, with from one hundred and twenty-five to one hundred and fifty feet spread. If it had not been for the demand for ship timber there would be many more now standing in Essex County. He wished to emphasize the enjoyment and delight of tree planting.

President Appleton spoke of a very exposed lot of land at Gloucester, owned by T. Jefferson Coolidge, who had had it laid

out and planted with Scotch pines. They had grown wonderfully well and as houses took the place of the trees they were well protected.

Leverett M. Chase said he was greatly interested in the subject before the Society. In walking two hundred and six miles from Liverpool to London he had been struck with the beautiful trees, especially the great oaks on the college grounds. He commended Evelyn's Silva, in which we find an account of the beautiful forests of England. The planting of oaks, he said, was the foundation of the naval power of England. Mr. Chase told how John M. Way of Roxbury had prosecuted line men for injuries to his trees and received damages. The same man had prosecuted a physician whose horse had injured his trees. In answer to a question by Mr. Spooner, Mr. Chase said he was not sure that the law as to trees being injured by electric companies is still in existence.

Rev. Calvin Terry thought no special law was required. Trees are private property, and persons injuring them are liable. Roots will go a long distance seeking food. They will steer for food and water and find them. There is a divinity in their instinct. He likes the sugar maple.

Mr. Chase said that he admires the elm; there is nothing more beautiful than a perfect elm. He spoke of the Whittemore elm in Arlington, said to have been set out by Samuel Whittemore in 1724. Fifty-one years later, when eighty years old, he took part in the Battle of Lexington, and was left for dead by the wayside, but he recovered and lived to sit in the shade of this elm till the age of one hundred and one.

The President called attention to a statement by Dr. Schenk, who is at the head of the Biltmore School of Forestry and an expert in forestry matters, in "The Capitalist and Economic Forestry," that in Europe investments in forests are considered safer than investments in government bonds.

James H. Bowditch invited all who are interested in the subject to attend the first lecture to be given under the auspices of the Massachusetts Forestry Association, on Thursday evening, January 25, in Horticultural Hall, on "Forests and Roadsides in Massachusetts."

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, JANUARY 27, 1900.

A meeting for Lecture and Discussion was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

The following illustrated lecture was delivered:

THE PROCESSION OF FLOWERS IN PENNSYLVANIA.

By Miss MIRA LLOYD DOCK, Harrisburg, Pa.

Prologue, without slides.

The title is adapted from Helen Hunt's "Procession of Flowers in Colorado," one of the most sympathetic sketches of the varied plant life in the home of her adoption. Her vivid sketches have left their impress in all portions of Colorado, where her flowers and her words are held in such loving remembrance that even the little pressed specimens acquire an interest from the quotations accompanying them. Mrs. Jackson's title was adapted, with his consent, from Colonel Higginson's "The Procession of the Flowers."

With few exceptions, the subjects chosen for illustration have been gathered in several very small areas, all lying within a radius of one hundred miles, and ranging from tidewater to an altitude of one thousand feet. About one-third are from the immediate vicinity of Harrisburg, on clay and limestone soils, and also from rich woodlands on the mountains near; a few are from shaly soil, but the most interesting ones are from two very rich botanical hunting grounds, one on the Lower Susquehanna, the other in the South Mountain, both on sandstone and quartz rocks, and both about fifty miles from Harrisburg.

The species selected have been somewhat restricted to those that are purely American or Asiatic-American in distribution. The arrangement has been based upon Asa Gray's writings on "The Flora of Japan," "The Flora of North America," and "Forest Geography and Archaeology." This arrangement would be of value in rural school gardens where the monotypic forms of

America, (such as Medeola and Sanguinaria,) could be planted together, associating the species represented in both hemispheres, a juxtaposition which must be interesting to true plant lovers. Even this small study of distribution would be of great value in showing the habit of our native plants, their method of growth and dispersion of seeds, in comparison with many of the introduced plants that we know as weeds, which latter often gain a tremendous ascendancy through the favorable conditions we provide for them, in removing the shrubbery and trees which sheltered our own less aggressive species.

Botanical nomenclature is the path along which many plant lovers have fallen by the wayside, dismayed and discouraged by the scientific names, which are frankly a hopeless impossibility to those who try to know names, without really knowing plants. For some inexplicable reason it is considered rather clever to rejoice in a large-hearted ignorance on the subject of botanical terminology, and this by the very persons who would be wretched if they were supposed incapable of talking on literary, musical, or art topics in technical terms. No one ever refers to a canary bird or parrot as a "biped," or to a collie or terrier as a "quadruped," yet really delightful, travelled persons will all the days of their lives speak of a familiar species of tree as "that tree!" Nothing is easier than to know the trees of one's own home, if one remembers John Burrough's advice and "takes his plants slowly," one at a time.

Nowadays, the many charming books on plant topics make it an easy matter to have at least a speaking acquaintance with one's outdoor neighbors.

Quite apart from the common meeting-ground that botanical terms afford to those speaking different languages, very much of human interest and history is contained in the old tomes that throw light on this subject. In some names we have terms that reach back to the twilight of history, as in Lily and in Lilac, both derived from the same Aryan root, which means "a flower."

How many explorations and discoveries are celebrated, as in the Claytonia Virginica and the Cercis Canadensis! How many friendships are commemorated, as in Magnolia, Kalmia, Mitchella, and Gaultheria! The names of our own common plants date back to those times in the seventeenth and eighteenth centuries when

new and unknown plants by hundreds were being sent by the Jesuit Fathers, from Canada to Tournefort in Paris; from Bannister, Clayton, and Mitchell in Virginia, to Ray and Dillenius at Oxford, and to Gronovius at Leyden; from Alexander Garden at Charleston to Ellis in London; from Cadwallader Colden at New York to Linnæus at Upsala; and from John Bartram in Philadelphia to all these centres of learning, but more especially to Peter Collinson of London, whose garden at Mill Hill, and Bartram's own garden at Kingsessing, were the points of departure for plants of both countries. In Bartram's garden, still happily preserved to us as one of the parks of Philadelphia, were planted the first China Asters, Oriental Poppies, Gladiolus, Norway Maples and Horse Chestnuts, noted in Colonial literature. In Collinson's grounds were planted the first Hepaticas, Cypripediums, Azaleas, Trilliums, Orchids, Kalmias, and Rhododendrons known in England.

The procession begins with the period of work, preparation, and rest, which, as in all processions, precedes the great massing of forces and unfurling of banners. It endeavors to show plants at home, their special friends, allies, and neighbors; their natural growth, and their change of habit due to change of environment. We study them comparatively, as we do other subjects, and as a picture reminds us of the school or period to which it belongs, so a plant may suggest to us its home ties, its far-off tropical, Alpine, or antipodal relations, the extinct members of its race, the great part that members of its family have played in the human drama. Thus we learn to think of our plant not as a mere rose or geranium, but as one of the links of the great world-chain.

The Procession.

In late autumn the procession is waiting orders. Banners are furled, buds folded close, and when the leaf curtain falls there is opportunity to see the massive boles and boughs of Chestnut and Oak, the tracery of weeds upon the snow, of the delicate articulation of Elm and Birch against the sky. Pushing aside the snow the Mayflower is ready to unfold, and in sheltered nooks Hepaticas and Dandelions open to the touch of the south wind. These are only marshals prancing up and down the line to announce that all

is ready; the true procession begins with the plant police, the Skunk Cabbages, who in March lead the way with helmet and club. Then the White Maple unfurls the first tree banner, followed closely by the Red Maple, whose crimson buds are an old story to us, but two hundred years ago were the pride of Bishop Compton, when his new American Maple opened its strange red blossoms in Fulham Garden. Then follows the Pussy Willow, a signal to look for the Mayflower in early April, one of the plants not known in Europe. With it and following after are Hepatica and Bloodroot, the latter growing only in Eastern America; the Hepatica with cousins in Europe but not clad in chinchilla, as Helen Hunt calls its protective fur. Both of these were named at Oxford about 1735 by Dr. Dillenius, in the Botanic Garden across from Magdalen College.

The Frog and Bird bands have long begun their music, and when the glens show the golden mist of Spice Bush, and the white tassels of Service Berry, the first great battalion of spring flowers reaches from curb to curb.

Spring Beauty was sent by its finder, John Clayton, from Virginia to Dr. Gronovius, at Leyden, who named it after the sender, and it has a still closer association for us when we think of that young medical student in 1828, taking it home in a New-York village and analyzing the first of thousands of blossoms to pass through the hands of Asa Gray. The forest floor is carpeted now with Toothwort, Saxifrage, Dogtooth Violet and the great Chickweed called after Michaux; with Anemones and the beautiful lustrous leaves of the Wild Ginger, blue Gill-over-the-Ground, and pink Lamium in attendance.

When Wild Cherry powders woodlands and fields, and the sun filters through the delicate green of Birch catkins in late April, we look for the most beautiful of our spring blossoms, the great White Trillium, known these two centuries in English gardens as the American Wood Lily. It reaches its fulness of bloom when Anemones are at their height; and surely a hillside starred with these is worthy of protection!

All this time Fern Croziers are uncoiling; on the stipes of the Cinnamon Fern we see the down gathered for their nests by Humming Birds. Follow the croziers down to the massive rhizomes of the Osmundas that hold and buttress swampy soil or hill-

side; see the root-tips of Rock Polypody as they slowly wear away the rock to form soil! See the folded buds of next year's fronds, the fronds that are to follow them even now blocked out, and consider the destruction of beauty when thousands of these are rudely plucked from their anchorage!

When woodland borders and roadsides are flushed with the pink of Redbud blossoms in early May, the second spring battalion has arrived. On rocky banks Wild Pink makes a brave show, Mitella holds its spears upright, on dry banks the Bird-foot Violet is set in gray Reindeer Moss; in dry grass are the invisible spears of Blue-eyed Grass, the orange plumes of Puccoon, and everywhere sweet Quaker Ladies. In rich woods lavender Phlox and dark Trillium mark time for the showy Orchis to rise from its green sheaths. The flaming leaf sheaths of young Hickories unfold, and woods are starred with red-berried Elder, Viburnums, and Dogwoods. (See the admirable suggestions made by Professor Shaler as to Roadside Parks, in his "American Highways").

As Mitella fades, Columbine nods from the same cliffs, and sometimes on the cold damp side of these we find great masses of Meadia, the American Cowslip of English gardens. With these the pink Azalea with its color and grace, and Wild Crab with its loveliness and perfume challenge the new stars of the woods, the Moccasin Flowers. These were among the earliest foreign Orchids introduced into England, and whether the glorious *Cypripedium spectabile* with white lips tinged with pink, or the yellow *pubescens* was first, we do not know, but the pink *acaule* was sent by John Bartram to Collinson, bloomed in 1738, and was figured from that plant by Catesby. (The *pubescens* attains great age, one plant shown having the scars of twenty-seven years,—first bloomed during the Franco-Prussian War. Gerard figured the English species three hundred years ago).

With these aristocrats of the plant world, the humbler Jack-in-the-Pulpit and Solomon's Seals are marching along, and the curious dark cinnamon blossoms of the Papaw are stiffly set on their angular stems. When May-Apples bloom, the high-water mark of spring is reached, and late in May the drooping white racemes of Locust mark the approach of summer. A true plant shrine is that corner of the Jardin des Plantes in Paris, where the first locust ever seen in the Old World bravely holds its own,

though planted in 1636. Following the Locust are the green and orange cups of the Tulip Tree, the Virginia Lily Tree of early explorers.

Then comes the great glory of our Appalachian hillsides, the Kalmia or Mountain Laurel, found nowhere in the world but in Eastern North America. In his garden at Upsala we can fancy Linnæus watching the growth of the American plants brought by his returned student, Peter Kalm, and listening to the tales of the vast thickets of the shrub he named after his student. While Laurel crowns the hills Pentstemons are nodding on banks, and everywhere Roses shedding their petals, reminding us that spring has passed:

"Alas that Spring should vanish with the Rose!"

Other plants of that race appear throughout the summer, but except the Swamp Rose, they are not true roses of bank and field.

Summer brings the Sweet Bay, the plant of long coastal range, ancient history and many memories of Raleigh's Virginia expedition, of Cotton Mather, and of the French Botanist Magnol, after whom it is named. The fragrant white Azalea of Craddock's pages is passing now, and swampy meadows are tinted with the pale pink of Pogonia, the deeper pink of Calopogon, and the stately spikes of purple and white Habenarias. Our American Calopogon was the first Orchid figured in Curtis' Botanical Magazine (in 1790) and no plant will better repay microscopic study.

When Catalpas bloom and Chestnut tassels powder the woods with gold, the "Midsummer pomps" of Arnold have come, and the Appalachian Woods are in full panoply, marshalling their stateliest flower, the great Rhododendron. It ranges from Berkshire to Georgia, has relatives on the Alps, the Pacific coast, Eastern Asia and the Himalayas, but the Mountain Rhododendron belongs to Pennsylvania by priority of discovery and description.

In 1734 John Bartram made a journey up the Schuylkill beyond the Blue Mountains, and at some point near where Reading now stands found a plant whose seeds he sent to Collinson, packet No. 102, with a description that must have been somewhat enthusiastic, for ever after Collinson spoke of it as "that Noble Laurel thee discovered beyond the Blue Mountains," and said "this

seems to be the most elegant tree discovered in your province." For several years hopes and fears rose and fell over specimens of this plant sent to Collinson and Lord Petre. For several years there was only wonder and admiration for the "noble Laurel" that grew, but would not bloom, and until it bloomed the botanists could not name it, so from descriptions of its rose-colored flowers it was called the "Rock-rose of Pennsylvania." In 1739 Mr. Hamilton sent over blossoms of the plant, which enabled the botanists to classify it, as the *Rhododendron maximum* (the Great Rose-tree). Prior to this discovery the low Alpine forms had the prefix "chamae" (Ground Rose-tree) attached. Within the next two years the Pontic and Siberian Rhododendrons were received by Collinson, but not until after the *maximum* was well known to collectors of that period.* Hosts of lovely small blooms carpet the ground—Wintergreen, Veronica, Hop Clovers—but in July the meadow flowers draw us to feathery plumes of Meadow Rue, the golden disks of Rudbeckia, and the splendid bells of Turk's Cap Lily, close cousin of the "Lily of the Field" of Palestine. A fascinating study can be made of their habit of inflorescence, the pendulous buds responsive to but not disturbed by every breeze; the slow movement of the peduncle as the flower expands; the gradual upward movement of the pistil, until within ten days from the opening of the flower the capsule has passed through more than one hundred and eighty degrees, and placed itself in a position of safety, its now rigid peduncle turned slightly in towards the stem.

In sultry August the deep rose of the Swamp Mallow enriches every swamp where it blooms, and pink is everywhere rampant, from the Milkweed along streams to the damp fields where great tufts of Joe-Pye Weed hold sway, and thickets lovely with Meadow Sweet are reached through beds where Deer Grass opens its curious stamens, and pink Gerardia bells hang for a day, all these intermixed with the ivory balls of Button Bush, this plant having the odd distinction of being the last plant noted by Humboldt and Bonpland, as they embarked at Wilmington for France in 1814.

While all these swamp friends are hastening by, in dry fence corners we find White Spurge, insignificant cousin of the splendid

* Address on Bi-centennial of John Bartram's birth, before Pennsylvania Historical Society, Philadelphia, March 23, 1899.

Poinsettia, in Oak woods the delicate fringed bells of starry Campion nodding above ghastly Indian Pipes, the still whiter Amanita, and in odd nooks the ecru and tan Chantarelle lifts its trumpet; and with all of these, the loveliest of the Figworts, yellow Gerardia, named after our old friend the Herbalist, whose portrait painted three hundred years ago, shows him proudly holding a sprig of the latest floral novelty, the American Potato!

Just as the procession seems to have reached a sameness of sound and color, there come in August new and stirring notes, the splendid blues and scarlets of Lobelias, the purple and gold of the great army of Compositæ, the scarlet spikes of the Cardinal Flower heralding the beginning of the end.

"Hail and farewell, prince, prelate of the August wilderness,
That in the dell hearest a mass said for the soul of summer by the birds."
(GRISWOLD DICHTER, "A Floral Calendar.")

Enter Autumn with forces thickly massed; the white of Wood Asters, the lavender of Swamp Asters, the deep purple of the New England Asters in fields, great clumps of white Boneset close to the rose-purple Vernonia—an enchanting combination of color—and high above all the pale gold of giant Sunflowers, while Golden-rod has marched with all of these and earlier blooms. In September we find the Turtle-head and the Closed Gentian with its metallic lustre shining by blanched Dicksonias. The trees now monopolize crimson and gold, as the Fringed Gentian opens its eyes; and as leaves crisp, the belated golden filaments of Witch Hazel stream forth.

Then the noiseless feathered seeds of Clematis and Milkweed flutter through the air, the color fades from Maple and Oak. Now comes the stillness of the "beautiful Summer of All Saints," then the "volleying rain;" the leaf falls, the procession has passed!

BUSINESS MEETING.

SATURDAY, February 3, 1900.

An adjourned meeting of the Society was holden today at eleven o'clock, the President in the chair.

Charles E. Richardson read his Annual Report as Treasurer, which had been approved by the Finance Committee. The report was accepted and referred to the Committee on Publication.

The President reported to the Society the disposition, stated in the following letter from the President of Harvard University, made by the Corporation, of the Stickney Fund, which was held by this Society for thirty years, and, agreeably to the terms of the indenture between the Society and Mr. Stickney, was paid over to Harvard University on the first day of February, 1899.

HARVARD UNIVERSITY,

CAMBRIDGE, January 9, 1900.

DEAR MR. APPLETON:

I wish to report to you at once that the Josiah Stickney Fund of $12,000, which was for thirty years in the keeping of the Massachusetts Horticultural Society, was yesterday assigned by the Corporation to the support of a course to be given at the Lawrence Scientific School of Landscape Architecture. Mr. Frederick L. Olmsted, Jr., is to be the Lecturer, and he will have an assistant, Mr. Shurtleff of the Olmsted office. Of course only the income of the Stickney Fund will be used. I am sure you will find this application of the fund highly appropriate.

Very truly yours,

CHARLES W. ELIOT.

GENERAL FRANCIS H. APPLETON.

The following named persons, having been recommended by the Executive Committee as members of the Society, were on ballot duly elected:

ROBERT MELROSE GRAY, of North Easton.
FRANCIS L. HIGGINSON, of Boston.
THOMAS HOWDEN, of Whitinsville.
JOSHUA LAWSON, of Brookline.
JOHN C. PHILLIPS, of North Beverly.
PETER B. ROBB, of Whitinsville.
MISS MARY RODMAN, of Concord.
LAWRENCE TUCKER, of Boston.

Adjourned to Saturday, March 3.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, February 10, 1900.

A meeting for Lecture and Discussion was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

The following illustrated lecture was delivered:

GARDENS, FIELDS, AND WILDS OF THE HAWAIIAN ISLANDS.

By JOHN K. M. L. FARQUHAR, Boston.

The trans-Pacific tourist who spends only a few hours at Honolulu, while a steamer is discharging and receiving passengers and cargo, can get little idea of the fertility of the Hawaiian Islands. Approaching Honolulu one sees the blue outlines of extinct volcanoes, and, drawing nearer, the sun reveals barren mountains of crumbling lava, with occasional patches or fissures of vegetation. It is not until one actually travels among these volcanic masses that any conception of the marvellous fertility of the valleys which intersect them is had.

Formerly many of these mountains were covered with timber, chiefly sandalwood, the sale of which formed a source of revenue

to the kings of the islands until it became exhausted. The Bureau of Agriculture is now making efforts to replant them. Certain varieties of eucalyptus and acacia have been found most successful. The Algaroba, which was introduced about thirty years ago, is of great value for planting on arid lands, and on Oahu we find more of this tree than of all others combined. Its delicate pinnate foliage is always green, and in periods of extreme drought furnishes excellent fodder for cattle and horses, while its sweet seed-pods, which resemble wax-podded string beans, and have the flavor of St. John's bread, may be ground, and the flour made into wholesome bread for man.

The best shade tree in the vicinity of Honolulu is the monkey-pod, *Albizzia bicolor*; a tree of very dense and spreading habit and bearing beautiful purplish lilac flowers, which remind one of giant Sweet Sultans. The tamarind thrives here, attaining a greater height than the monkey-pod, and although the foliage is much finer, it is dense and gives ample shade. Splendid specimens of banyan are also met with, one of the best being in the grounds of the late Princes Kaiulani, and nearly overgrowing her beautiful residence.

There are several trees bearing remarkably showy flowers; among them *Cæsalpinia regia* becomes when in bloom a mass of flaming scarlet; *Cæsalpinia sepiaria* bears large deep yellow blossoms, and *Cassia fistula*, commonly called Golden Shower, bears enormous golden yellow flower clusters. The seed pods of these trees are usualy from fifteen to eighteen inches in length.

The Royal palm, *Oreodoxa regia*, is employed to line avenues. It grows about two-thirds as high as the cocoa nut, the trunk being perfectly perpendicular, while that of the cocoa nut is always bent. The Date palm is similarly used and affords more shade; an objection to it is the fact that the fruit when ripe drops freely and litters the roadways. A tree photographed near Honolulu had eight clusters of fruit, each of which would have filled a half a bushel measure or more. The dates are of fair quality, but as the climate suits them, the finest sorts should be introduced.

Caryota urens known as the Wine or Fish-tail palm is extensively employed for landscape decoration. The specimens seen are usually about thirty feet in height, generally bearing two or more bunches of fruit. The erect, bipinnate leaves of this palm

are of light and graceful appearance, and form a pleasing contrast with the heavier foliage of other tall sorts. More than one hundred and fifty varieties of palms are now grown on the islands.

The little Otaheite orange, which is now seen here in pots in florists' windows attains in Oahu a height of forty feet and bears abundantly. Notwithstanding the fact that citrus fruits luxuriate on the islands, more than five thousand dollars worth of lemons and oranges are annually imported from California. Delicious figs, much superior to those sold in California, are sold by native children on the roadsides at five cents a dozen. Bananas may be grown on all the islands. In the vicinity of Hilo they do particularly well, and there irrigation is unnecessary. Unfortunately the varieties grown are not the best for market or export. The magnificent yellow bananas which are brought to Boston from Golden Vale and other plantations in Jamaica are much superior. The best Jamaica variety of *Musa sapientum* should replace the small *M. Cavendishii*, now grown. The islands would then be able to supply cities west of Chicago with such fruit as is received on the east coast from the West Indies, the distance by sea being about the same.

Cocoa nuts may be grown on any of the islands near the coast; they receive little attention however. The only extensive grove seen was near Waikiki in Oahu.

Guavas grow wild in all the islands, from the sea level to an altitude of about three thousand feet. They are chiefly useful for preserves. The ground cherry is found in abundance within the same limits, and at about two thousand feet a red raspberry (*Rubus Hawaiiensis*), of rather insipid flavor, bears profusely. Strawberries and raspberries have been introduced and yield fruit the year around at from two thousand to three thousand feet elevation.

The Papaw (*Carica Papaya*) is a very singular fruit, borne on a tree somewhat resembling the castor-oil plant. The fruit is very rich in sugar and is used to feed chickens and pigs. It contains a milky juice which has the property of rendering tough meat or fish quite tender. Sometimes a piece of the fruit is boiled with tough chickens, making them tender and easily digested. Fresh meats and fish are similarly improved by being wrapped in the leaves of the papaw for a few hours, and the natives make this a

practice. The leaves of *Dracæna lutea*, which is indigenous, take the place of wrapping paper in the markets. In broiling fish the natives invariably place it between two of these leaves for the pleasant flavor which they impart. Formerly the natives made a distilled liquor from the roots of this Dracæna; of recent years its manufacture has been prohibited by law and the natives who were addicted to its use now take gin instead, with which it was almost identical in flavor and appearance.

The success of the sugar planter has been detrimental to the development of other lines of agricultural industry. One finds on the islands, century plants with leaves from eight to ten feet in height, yet the Sisal plant, which is a variety of the century plant, is not grown. Cocoa, olives, mangos, limes, lemons, oranges, figs, and finer grapes should become profitable crops for mountain slopes and other lands not adapted to sugar cultivation. Progress in this direction can hardly be made, however, until better varieties of these fruits shall have been introduced. Most of the improved sorts needed could be obtained in Jamaica. When it is learned, however, that the sugar plantations have yielded as high as sixty tons of cane per acre, giving when crushed twelve tons of sugar, or more than double the average crop on the West Indies, and making possible annual dividends of from fifty to seventy-five per cent, it is not surprising that other branches of agriculture have been overlooked.

The most productive sugar plantations of Oahu are reclaimed arid lands composed chiefly of pulverized lava, which were more or less occupied with *Opuntia truncatum*. Dense masses of this cactus are to be met with, each mass extending over several acres and attaining a height of from twelve to eighteen feet. The Opuntias on the dry lands and the tree ferns in the moist regions have been valuable agents in the formation of loam deposits.

On the beaches of Oahu, the loose sands are frequently covered with the ivy like foliage and brilliant rosy red blossoms of *Ipomœa Turpethum*; a little farther back may be seen *Argemone grandiflora*, *Ipomœa Batatas* and *I. insularis*, the last having beautiful light blue flowers of large size.

Lantana hybrida and *Acacia Arabica* have become troublesome, weedy shrubs. Hundreds of acres are invested with these pests;

the vast crater of the extinct volcano, Punch Bowl, overlooking Honolulu, is completely overrun by them.

Many beautiful wild shrubs are to be seen on the mountain slopes or in protected valleys, among which may be mentioned *Sesbania tomentosa*, *Gossypium tomentosum*, *Hisbiscus Arnottianus*, *H. tiliaceus* and *H. Youngianus*.

An enterprising Greek fruit dealer named Camarinus introduced the Smooth Cayenne pineapple, intending to grow it for export. He sold his first crop in Honolulu for seventy-five cents apiece. He enlarged his plantation and in addition to supplying the home market now does a profitable export business.

The food of the natives from their earliest history has consisted chiefly of fish and poi. Poi is made from the root and lower part of the stem of the *Caladium esculentum* or taro, which is boiled for half an hour, then placed in a wooden trough and pounded to a fine paste with a stone pestle. It is interesting to watch the operation of poi-pounding. The operator holds the pestle in one hand, while the other is immersed in a pail of water at his side. After each stroke the base of the pestle is slapped with the wet hand, the moisture thus applied preventing the poi from sticking to it. Poi is of bluish appearance and tastes somewhat like apple sauce, although devoid of sweetness. The natives prefer it when somewhat fermented. Taro is a profitable crop, yielding usually about three hundred dollars an acre. It requires partially submerged land.

Large tracts of swamp land to the south of Honolulu have been improved by the Chinese and are now flourishing rice fields; while the deeper mud holes have been planted with the pink lotus, *Nelumbium speciosum*, the thick starchy roots of which they eat.

The vegetables found in the markets are mostly grown by the Chinese, and there are offered soja beans, Chinese cabbages (which, by the way, is a vegetable that should be grown in the States), and oriental cucumbers and gourds, side by side with almost all the vegetables found in markets here, for even potatoes and corn may be grown at from two thousand to three thousand feet above the sea. Four-fifths of the arable land of the islands is situated on Hawaii, and this island when encircled by the railway now in progress of building, and its harbor at Hilo improved, cannot fail to become of great importance.

Its lofty volcanoes pierce the clouds, causing ample rainfall and producing the most luxuriant vegetation. In the Olaa district, famous for its fine coffee, are found tree ferns from thirty to forty feet in height, with fronds fifteen feet in length and five feet broad. In fact, the tree ferns have made the coffee land, which is rich fern peat; the planter in clearing it usually saves their trunks to form sidewalks and paths. The roadsides of the Olaa district are often lined with beautiful varieties of Coleus and Brugmansia which have become wild.

Nephrolepis exaltata and several varieties of Davallia and Gleichenia form most of the undergrowth in the district between Hilo and Kilauea, while the forest comprises *Pandanus utilis*, varieties of Alsophila, Cibotium and Dicksonia. Where trees occur they are usually invested with *Asplenium nitidum*, *Smilax Sandwicensis* or *Freycinetia arborea*, the last quickly choking them and causing their decay. A tree covered with Freycinetia is, however, a most beautiful object, the green foliage and crimson bracts being very striking in appearance.

Higher up there are vast forests of the beautiful crimson flowered Lehua trees (*Metrosideros polymorpha*). Olaa should become a centre for the raising of Easter lily bulbs. The even climate, with its copious rainfall and a soil composed of fern peat overlying porous lava and affording the most ample natural drainage, gives most favorable conditions for their growth. Then as the seasons are practically obliterated here, the cultivator may plant and arrange for a crop of mature bulbs in any month of the year he may desire. There would not be as much danger of blight here as in Bermuda. A trial lot has already been planted and most encouraging reports of their success have been received.

As already stated many handsome varieties of hibiscus are indigenous to the islands, and among the most beautiful features of Honolulu are its magnificent hedges of *Hibiscus Rosa-sinensis*. Another beautiful hedge plant is the *Phyllanthus tricolor*. Imagine one of the beautiful privet hedges in Newport suddenly changed to a rosy lilac color, and some idea of the beauty of a Phyllanthus hedge may be had.

A very effective lawn bush is the so-called yellow oleander (*Thevetia nereifolia*), with clear yellow trumpet-shaped flowers. The pink oleander here attains a height of thirty feet and produces flowers as large as hybrid roses.

Flowers are seldom made into bouquets, as in the States; the natives string them in wreaths or leis, which are worn around the hat, over the shoulders, or about the waist. Carnations, yellow ginger, *Plumeria bicolor*, the scarlet seeds of the screw-pine and the crimson Lehua blossoms are thus employed. Among the natives a beautiful custom exists which it is hoped will not soon die out. When a person is about to make a journey, friends bring and present each two leis, both of which are accepted and worn until the train or boat starts, when one is returned with the last "aloha" (farewell) to the giver, and the other retained, thus providing a souvenir for each.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, February 17, 1900.

A meeting for Lecture and Discussion was holden today at eleven o'clock, Vice-President BENJAMIN P. WARE presiding.

The following lecture was delivered:

THE FUTURE OUTLOOK FOR THE FRUIT GROWER.

By S. D. WILLARD, Geneva, N. Y.

Mr. Willard prefaced his lecture by saying that he was fearful lest his audience should be disappointed. It is not always the simply practical man who is best able to put his thoughts into words to the highest advantage of his hearers. Much of the inspiration in regard to fruit growing has been derived from Massachusetts. Plum growing has been a feature in his life work; hence there may be varieties in regard to which he is better informed than others.

Amid the various industries that engage the attention of men in connection with soil tillage there is none that has been so neglected and yet that possesses the same attractions as fruit culture. A few whose enthusiastic love for the work has been marked with success, have been the exceptions, while the indiffer-

ence of the masses to the application of such intelligent business principles as are demanded in the prosecution of other undertakings, resulting in failure, has caused others whose capital might have found profitable investment and afforded a healthy and pleasant employment to hundreds of the best young men of our country, to take up their life work in the mercantile house or in the already overcrowded professions, all so exacting in their requirements that the limit of human endurance is reached at an early age by thousands who go to premature graves. And yet the procession is swelling, with no inclination to utilize the thousands of acres of waste lands that may be had at a price that makes them the cheapest investment of the times. Our object is to awaken a new and deeper interest in an occupation ennobling and elevating in its nature, contributing to health and long life in mankind, while assuring profitable returns to all willing to devote their energies to an intelligent effort to secure honest livings and pleasant homes free from the excitement and unnatural conditions that attach themselves to other spheres of life.

Within the memory of most of us the advice of one whose opportunities for observation had been of so wide a range as to inspire respect for his sayings, was "Young man go west." Were he living and one of this audience today, I imagine with the same prophetic visions he would say "Lay hold of and put to a practical use some of these cheap lands that may be found between the lakes and the ocean, especially adapted for products that cannot be grown as well elsewhere, which are in growing demand at home and abroad, and are required to meet the wants of a rapidly increasing population."

I offer to you my congratulations, and the Ruler of the Universe my thanks, that our homes are amid such environments, calculated to develop the best there is in man, and as we are here assembled let us not underestimate our opportunities or ignore the responsibilities we owe to the generation that is to follow, in our efforts so to shape public sentiment that our life work shall be for the greatest good to the greatest number.

A few days ago there were assembled in the city of Rochester, N. Y., for a two days' meeting the largest body of fruit growers that ever met in the Empire State, to discuss questions pertaining to their interests, and determine on what lines their future work

should be prosecuted. It was estimated that from five to six hundred were in attendance, and the greatest interest was manifested from start to finish. How great the contrast as compared with thirty years ago, when the same body in convention assembled would rarely open with an attendance of more than twenty-five or fifty. At that time the society could not be maintained from the membership fees and annually required liberal contributions from the late president and members to pay for the work of the secretary and the publication of its proceedings.

Those were indeed dark days in the history of the Western New York Fruit Growers' Society, whose members were doing better work than they supposed, and an interest was awakened, and an inspiration received from a similar work in your own State on the same lines, which has been the basis of the development of an industry today paramount to any other in the Empire State. The names of Wilder and Barry will ever live to be associated with the fruit-growing interests of the United States, and held in grateful remembrance by its advocates. Reference has been purposely made to years of persistent effort upon the part of those whose farsightedness enabled them to forecast the future. "They lived in advance of their generation."

But what of the future? There is certainly a meaning in the situation as found today in the rapidly growing interest in our favorite work, not yet, however, commensurate with the spirit of the times in which we are living. The day is not distant when a higher appreciation will be placed upon our orchard interests and their value intensified more thoroughly than the most optimistic can imagine. The era of prosperity upon which we have just entered and which has enhanced values of everything manufactured, has not yet reached the tiller of the soil to any marked extent, but sufficiently to afford encouragement and to warrant the assumption that better days are at hand for the fruit grower in the various branches of his work. This possibly may not be so marked as in other business interests, for the reason that during the period of business depression from which we have but so recently emerged, the prices of all fruit products were better maintained than was anything else sold. I find from consulting my sales book back through a period of ten years, that the average prices, while less than during the same period previous, were

yet satisfactory and afforded a profit. Indeed I know of no orchard men who were forced into bankruptcy or sold out under foreclosure.

The prices of apples have been steadily advancing until for several winters they have been held so high as to be beyond the reach of the masses, and good number one apples are really a luxury today. They are shipped to all parts of the world as green fruit, canned, and evaporated, while the skins and cores are converted into wines and jelly, so that nothing is lost or wasted. A few years ago our surplus of this fruit was marketed in the British Isles, while today the German States and Russia are calling loudly for them, with the probability that our newly acquired possessions, both in the Atlantic and Pacific, will soon be numbered among the consumers of this king of all fruits. From twelve to fifteen thousand barrels of apples of the last year's crop found their way into Russia. Seven counties in Western New York are said to have received from their apple crop not far from $5,000,000 the past season, while at the same time receiving hundreds of thousands of dollars for their pears, plums, peaches, quinces, cherries, apricots, and small fruits. Is not the outlook full of encouragement to the orchard man as well as to the land owner who may have found his work unsatisfactory in fighting competition, which will never be less, from regions unfitted by soil or climatic conditions for growing fruits that can be produced no where else as well as in New York or New England? I beg your serious consideration to this subject as deserving more thought and careful study than has usually been given it. There should be an increase of area for the production of this fruit on the cheap lands now so abundant throughout this region, accompanied with greater intelligence as to varieties especially adapted to commercial work, and more thorough culture with the purpose of growing only that of the most excellent quality.

Where is the man living who thirty years ago would have dared to predict that before the close of the century single towns in the State of New York would have produced and found profitable markets for cherries by the hundred tons, plums, peaches, pears, and quinces in much greater quantities, apricots by hundreds of bushels, and small fruits to correspond? Yet such is the fact, and the demand is yet in advance of the supply. Is not the out-

look full of encouragement to the professional fruit grower who is receiving from one hundred and fifty to three hundred dollars per acre net for his crops? A friend the past season with a thirty acre peach orchard sold his crop for a little more than seven thousand dollars, from two car loads alone realizing between fourteen and fifteen hundred dollars. The quality was superior; he made the crop by high culture. A large crop of Angouleme pears netted the shipper between fourteen and fifteen dollars per barrel, carefully estimated, the fruit being packed in bushel boxes and shipped to England. It is unnecessary to say that it was grown, packed, and handled on business principles. There were crops of plums that netted the grower from three to four hundred dollars per acre, and currants that yielded returns of four hundred dollars per acre. Instances could be multiplied of like results, and though you may say they are exceptions, is it not equally true that success is the exception in every department of life? It has ever been so, and ever will be, while intelligent industry will ever have its reward. With the wheels of industry in motion throughout the entire length and breadth of our land, offering constant employment to every man, woman, and child who desires work, I can see no reason why the grower of good fruit should not share in the general prosperity that apparently is to be a marked feature of the incoming century. But the successful fruit grower must be full of intelligence as regards his profession; and he should keep himself thoroughly read up on all the best methods to be employed in culture and feeding as well as handling and preparing for market, and the wants of the various markets sought, and last but not least, an acquaintance with all varieties of promise that are being introduced, some of which will certainly supersede those of today. Our population is changing, and with this comes a corresponding change in the taste of the purchaser and consumer. This feature I have found very marked in varieties of plums that I have been growing; varieties that are strongest in demand and sell at the top of the market today, were scarcely known fifteen years ago. This has necessitated grafting over hundreds of trees to newer sorts. Quite too many in making their selections for the contemplated orchard seem to pick from every page of a nurseryman's catalogue instead of confining themselves to a few varieties of known value, or seeking the advice of an orchardist

near by whose experience and opportunities would make him valuable counsel. Oftentimes a fruit of superior excellence is of little value to the commercial grower because lacking in the color, size, or attractive features demanded in certain markets. Color and size in nearly all fruit is at a premium, when possibly quality may be at a discount.

Not one of the fruits has been growing in demand more generally in recent years than the cherry. California has been supplying our city fruit stands with a product nice in appearance but much inferior in quality to that which can be grown easily and profitably in our own region. Should we not endeavor to supply our own market? As a rule the dark colored sweet cherries are most sought after for the trade of our cities. For years the Black Tartarian was the only sort grown for this purpose, but it is being supplanted by the Windsor, a variety having its origin in Canada and said to be very hardy, exceedingly productive, large, dark liver color, and so good in quality as to sharpen the appetite for more when eaten. I have been growing it in a moderate way for several years and only wish I had been wise enough to plant it largely when first introduced. No fruit has ever paid me better. In 1898 the crop sold for ten cents per pound, and in '99 for twelve cents per pound. It may be included in the list of money makers in all localities where any sweet cherry can be grown with success.

A few years ago I had sent to me from Oregon for test purposes a variety then known as the Bing. After fruiting it for two seasons I am inclined to regard it as an acquisition and worthy of a test by all interested in growing the cherry. It is large, of good quality, in color resembling the Windsor but ripening a trifle later, and productive beyond anything in the shape of a cherry I have ever grown. Its size and fine appearance should make it very desirable for market. I measured many specimens that had a circumference of from three to three and one-half inches, and referring to the Annual Horticultural Report of the State of Oregon find it very highly commended, and reported as the most promising cherry yet introduced there. As for sour cherries, I know of nothing superior to the Montmorency and English Morello.

It seems to be strongly in evidence that we have little to fear in

the future from the competition of Maryland and Delaware in peach growing, while on the other hand great progress is being made in the development of varieties of such hardiness in fruit bud as to be adapted to our soil and climate, and we believe we are justified in assuming that here is a field for the progressive fruit grower full of promise that has yet been scarcely considered.

The very rapid increase of insect life of an injurious character has necessitated knowledge in relation to their life work and habits that years ago were not required, and the spraying pump has come to be regarded as a necessary appendage to all well regulated fruit farms. Indeed systematic spraying at proper intervals from early spring until after the fruit is well formed is claimed as the cheapest insurance that can be provided for nearly everything grown. The wise up-to-date orchardist finds it an economical method in making a superior crop, while his careless neighbor, furnishing a feeding ground for all of the pests that abound in the vicinity, produces a crop of knotty, worthless fruit, denounces the party to whom he has consigned it for sale as a fraud, and argues that the business is overdone. This is no exaggeration but is in evidence annually.

For the past two years the increase of the tent caterpillar and forest tree caterpillar has been quite phenomenal over a large part of the State where I reside, and, when neglected, thousands of trees have been entirely stripped of their foliage, the growing crop ruined, and no opportunity given for the formation of fruit buds for the next year. Upon my own grounds more than three thousand nests of the former were destroyed upon our apple trees as soon as they were formed, and the foliage was left uninjured to perfect the buds for a future crop. This, however, was scarcely done before we discovered an innumerable number of forest tree caterpillars clustered upon the bodies of plum, cherry, and peach trees. These were likewise destroyed before injury had been done. But the roadside trees, trees on rented lands, and neighbors less careful, provided the seed bed from which emanated a crop that has enabled us to destroy during our Winter trimming between four and five thousand of the little egg clusters or bands that hatching in early spring would furnish another army to feed upon the fresh foliage.

Our agricultural colleges and experiment stations have taught

us how to contend successfully with most of these insect foes. The San José scale, however, is an exception. So minute as to be scarcely discernible except by the educated eye, and even then often requiring the aid of a microscope, this most dangerous of all insects is spreading at a rate that renders its extinction by no means probable. It has today a strong footing in most of the fruit-growing States and so far has resisted such treatment as has been effective in destroying or holding in check most other insect pests. If left undisturbed for a period of five or six years, the infested tree or plant is of little value and should be dug out and burned upon the ground where it stood. If not too large to be covered, fumigation as practised in Maryland and Virginia may be effective. An effort is being made in the Legislature now in session at Albany, for the passage of a law requiring all nurserymen in the State to fumigate all trees or plants shipped into or out of the State, which I believe to be the most effective measure yet suggested for the protection of the planter, and I believe the purchaser fully justified in insisting that such a certificate should accompany every package of trees purchased, wherever bought.

If time would permit, a further discussion of this subject might be followed I believe, with interest to the grower of all fruits, and it is in the line of my topic "The future outlook for the fruit grower." Indeed I believe I should be recreant to the trust you have reposed in me, did I not sound the word of warning, and I say beware of the danger of introducing into your orchards this most serious menace to the fruit grower's interests, the San José scale.

Mr. Willard added that he could not understand why with all the cheap reading matter so abundantly disseminated so little is found in our farm homes. It is the first thing that he looks for in the morning, and the last thing at night, yet in many houses there is a dearth of it. He recently visited one man who has one hundred and thirty acres of land, nearly all orchard, and six hundred chickens but not a particle of reading matter.

The land on which our fruit orchards have hitherto been located are high-priced lands — $150 per acre, besides the cost of draining, which brings it up to $200. Every particle of land must be utilized. He planted a row of Windsor cherry trees alongside of

a road, and told his wife that the revenue from these trees would pay the taxes when they were too old to do it. Last year they did pay the taxes. His crop of ten tons of English Morello cherries went chiefly to persons in New York, who expressed the juice.

Probably we shall not have as much competition from Delaware and Maryland as heretofore. One orchard of twenty-eight thousand trees was blotted out by the San José scale. In Michigan, not far from Benton Harbor, is the best peach grower he knows of. His orchard is one hundred acres in extent and last year the crop sold for $35,000. He thins his fruit to six inches apart. He begins spraying at this season and follows it up.

In growing plums, Mr. Willard advised to protect from the curculio by jarring; he uses machines for this purpose. His foreman, in the spring of 1899, thought there was no need of jarring, for few curculios were being found, but they found great numbers of forest caterpillars feeding ravenously and in clusters on the bodies of the trees.

He had known repeated instances where trees had been dug up and the parts of roots left in the ground had sent up shoots which in two years had been covered with the San José scale.

At the date of the introduction of the Japan Plums, he obtained several lots of scions from California marked Botan. Observing what seemed to be a difference among them, they were grafted and recorded under numbers, one of them as Number 26. And from this trees were grown and sold to Mr. Heikes, of Huntsville, Ala., who renamed the variety the Willard plum. Its chief value was the early ripening of its fruit, but it has since been superseded by the Red June, which is earlier and in all respects more valuable.

Discussion.

William C. Strong asked about the President Wilder currant. Mr. Willard said that it had its origin in Indiana and is said to be a seedling of the Versaillaise. You may feed it all you please yet the wood will be strong, and the bushes will not break down, which cannot be done with Fay's. The berries are as large as those of the Cherry currant but the bunches are twice as long. Cherry currants must be marketed as soon as ripe whereas the President Wilder may be left for a long time on the bushes after it is ripe. No other will keep as long. Bushes four or five years

old yield from ten to twelve quarts of fruit. The first which he grew sold for twelve cents a quart in Boston market.

When asked about the North Star currant Mr. Willard said he would relegate it to the North Pole. The Red Cross has fruit of excellent quality but has failed to come up to the standard of a market fruit. For family use he considers the White Imperial best. No white currant is of value for market.

In answer to a question by William H. Spooner as to the Pomona currant the lecturer said if you want to get a good crop of the San José scale you can get it on the Pomona currant. T. G. Yeomans of Walworth, N. Y., bought some of them and soon found them covered with the San José scale. Instead of digging up and burning them he had them sprayed with one hundred per cent kerosene when they were beginning to develop. In September he found that the bushes though not killed were injured and still loaded with the San José scale. Mr. Willard said that he has all packages shipped marked with certificates of inspection. He recommended Bulletin No. 57 of the Maryland Agricultural Experiment Station, on the San José scale in Maryland and remedies for its suppression and control, by Professor W. G. Johnson, as the most practical treatise on the subject he had ever read.

The Chairman asked how to prevent the San José scale and Mr. Willard advised fumigating all trees as soon as received. The first thing he would do would be to put up a little box of his own for that purpose. No nurseryman raises all the trees he sells, and those he buys from somebody else are often infested. He considers inspection only partial protection to the orchardist and would urge the passage of a law compelling the fumigation of everything sold. He was Chairman of a Committee of the Western New York Horticultural Society to urge the passage of such a law. The bill proposed in the National legislature would be no protection. Fumigation is inexpensive when once you have the facilities. It takes about half an hour. The average cost, outside of labor, for the best apple, pear, peach, plum, and cherry trees is about twelve and a half cents for a thousand trees; labor would be as much more. In Maryland Professor Johnson says they have been absolutely exterminated by fumigation. Few are found in old orchards; they have only been introduced within a few years.

J. W. Manning asked whether it is known that this process kills the insect, and the lecturer again referred to Bulletin 57 of the Maryland Experiment Station, in which Professor Johnson says they were so thoroughly killed that none were seen for two years. Mr. Manning quoted Professor Alwood, who thinks the process does not kill all the insects. He says ten per cent will be left. Mr. Manning had had his nursery inspected by Professor Kirkland and had never found any of the insects until a year ago last spring, when he found a few. Professor Kirkland then said that he must make a fumigator, which he did at a cost of about five hundred dollars. He puts everything through the fumigator, but they are getting into forest trees and he feels that the case is almost hopeless. He wished to know if there are any trees which the San José scale does not work on. Mr. Willard said they will not get on evergreens, sour cherries, or the Keiffer pear.

Thomas Harrison asked if the Governor Wood cherry was of any value as a market cherry, but the lecturer had found it of no great value. It is not a good shipper and not the right color. Light colored cherries are more likely to decay.

In answer to a question as to plums, Mr. Willard said that he had tried to test them all. He found the Burbank and Red June most valuable for market. The Reine Claude de Bavay although the standard of quality is not so good for market. The Wickson, he thinks, has not yet been sufficiently tested.

On motion of Benjamin P. Ware a vote of thanks to the lecturer was unanimously passed.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, February 24, 1900.

A meeting for Lecture and Discussion was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

The following lecture, illustrated with lantern slides, was delivered under the auspices of the American Forestry Association.

Forestry in Massachusetts.

I. *Forestry.*
II. *Roadsides.*

By Mrs. Mary Lathrop Tucker, Newton.

I. *Forestry.*

In the part of this lecture dealing with forestry proper I shall endeavor to set forth a few of the considerations which should induce farmers in Massachusetts to cultivate timber, and to state as plainly as possible some of the most important principles underlying the proper treatment of woodlands, especially White Pine. Many important points have of course been omitted, as one lecture could not be exhaustive on even the simplest elements of forestry. Yet with these principles as a starting point, common sense and a little experience should enable a small farmer to improve and increase his woodland so much in a few years as to convince him beyond doubt of the profitableness of timber culture.

One of the most common and most vital of all mistaken notions about tree growth is that trees need no cultivation — that nature let alone will always produce the best possible results, both economic and aesthetic. Farmers would be astonished at the suggestion that wild cherries, apples, potatoes, or corn are as good as the cultivated species, or that weeds do no harm growing freely among their valuable crops. But many of these same farmers are hard to convince that large numbers of trees in their wood lots are mere weeds of no worth in themselves and injurious to the growth of the valuable timber, and that the value of their timber might be easily doubled or trebled by a little rational management.

It is a fact which lies at the foundation of all proper forestry that natural, uncared-for woodlands do not produce the most or the best timber. Unaided nature does often produce magnificent results, and up to the present time we have in this country been able to depend for our timber supply almost wholly upon the wild natural product. So when people are urged to practise systematic forestry — that is, to cultivate trees as civilized man cultivates

other crops instead of trusting like savages to the chance productions of nature, they are apt to point to the Pines of Maine or Georgia, to the New Hampshire Spruces, or the Sequoias of the Pacific coast as conclusive evidence that whatever assistance nature may require in producing the best and the most potatoes she is perfectly competent to raise trees without human interference.

But granted the best that nature can do, we are still confronted by conditions that will compel us to cultivate trees or soon to buy our timber of other countries more provident than ourselves. In the first place we have cut off or burned or allowed to burn nearly all our finest timber and cannot afford to wait for more to grow wild. For while unaided nature does, as we admit, produce wonderful results, it is only through a slow process of selection and elimination and a long, fierce struggle, often to be counted by centuries rather than by years or decades, that such results are evolved, and they are never sure in advance. Left by herself fifty or one hundred years nature is much more apt to give us timber stunted or worthless, with only here and there a good tree, and even with unlimited time she may do no better. Let anyone who doubts these statements visit a Massachusetts forest of natural mixed timber a hundred years old and in all but exceptional cases he will find most of the trees surprisingly small, comparatively few of even the oldest trees having a diameter over ten or twelve inches. Crowded by one another all their lives out of needed light, space, and air, they have grown in height with only slow increase in volume. Then the few trees that have managed to outstrip their neighbors have likewise been so hampered during much of their growth as to make their timber of comparatively little worth, and all have grown so slowly, as evidenced by the closely-packed annual rings, that the heart wood is often decayed before the tree has attained a third of its normal size. Moreover much of the ground is occupied by less valuable species; indeed, it is sometimes these very weed trees which overtop and crowd out the valuable timber, for the fittest, especially the temporarily fittest, is not always the best. Given a few thousand years more or less and nature might turn this forest into one of those marvelous productions which give us such confidence in her unassisted operations, or it might remain about as we see it today. But even supposing that with time the best results were sure, can we

afford such an enormous waste of time and material as unaided nature requires for her best work? The hot-headed American, when urged to raise timber scientifically as an investment, looks at you in surprise as an unpractical theorist and asks how you suppose he can wait fifty or seventy-five years for a return on his outlay. Such a man will not be likely to let his land remain in forest and leave it to his children to do the same waiting by the century for nature's slow processes that his posterity in some remote generation may reap the same magnificent timber harvest that we and our forefathers have been squandering. No, he will strip his woodland of its poor sprout Oak or scraggy Pine as fast as it is large enough for firewood or any other salable purpose, buying meanwhile the best timber elsewhere. But nature's most successful efforts have probably never produced, even with unlimited time so large a crop of the best timber as might have been raised on the same area with scientific cultivation—that is by assisting and hastening nature's own processes. In other words man can raise more and better timber on a given piece of land in from fifty to one hundred years than will be likely to grow wild in a thousand. And if in a century or half a century we can by cultivation raise a forest where every tree shall be a good tree why are we content with anything less? The practical question is, just how much cultivation it is profitable or desirable to give, for there is every possible degree of forest management from the most elementary to the most elaborate application of the principles of forestry. Just where for the New England farmer is the dividing line between profit and loss? We know that timber culture pays because many States and towns abroad derive very large revenues from this source. But will it pay on a small farm in Massachusetts? If so, what timber is it best to raise and by what processes, and how much labor and capital is it worth while to put into it?

There seems to me little doubt that, for the present at least, White Pine is the best timber crop for the average Massachusetts farmer. The wood is always in demand, having no substitute at all comparable to it, and our supply of the first-class article is in this State, as largely elsewhere, nearly exhausted. White Pine springs up readily almost everywhere on worthless pasture land or sandy wastes where hardly anything else of value can grow.

Among the Berkshire Hills it appears to be the only antidote for the all-encroaching shrubby cinquefoil, crowding out the pest when nothing else avails. Everywhere it seems begging to show what it could do with only a chance if man were not too obtuse to take the hint. There are thousands of acres of this poor cheap land in Massachusetts lying idle or growing up with young Pine which farmers often take more pains to destroy than all the labor they would need to put into its cultivation, cutting and burning it over to get for their cattle a barren pasturage not fit for goats. With a small investment of labor and capital all this land might soon yield a good revenue both to its owners and to the State, except by the seashore, where, affected by the salt water, White Pine will not grow, and there its place is taken by Pitch Pine, which also might be turned to better account than it is. White Pine, too, yields perhaps the quickest and largest returns of any valuable timber tree in this State, and there is little risk in its cultivation except from fire. But when land owners all over the State are raising high-priced timber public sentiment will demand more stringent laws for the prevention of forest fires and will see that they are executed.

The successful cultivation of White Pine depends upon very simple principles, which may be applied with any degree of elaboration. To gain the best growth seedlings should come up very thickly at first and then be thinned and pruned as they need more light, air, and space. Spots where they do not come up thickly enough should be reseeded. The seedlings need protection from sun and storm. This protection is often furnished naturally by small bushes like blueberry or sweet fern, or by herbaceous plants such as hardhack or golden-rod, or by other seedlings or sprout growth, as birch or oak, which should be removed when no longer needed. In seeding bare ground some cheap, quickly-growing crop like rye may be sown with the Pine seed to shade the seedlings the first year. Close planting is necessary to secure both vertical growth and clear timber free from knots. A Pine or other evergreen coming up in the open grows with large spreading branches close to the ground, more like an enormous bush than like a tree. But when the trees are crowded closely, the lower branches not having room to develop soon die and the nourishment that would have been wasted upon them, speaking from a timber-producing

standpoint, goes to feed the trunk, forcing it upward and making it tall and large. If we wish, therefore, to produce the largest amount of timber we must have the fewest possible side branches. Killing off side branches by close crowding is called natural pruning, but with many trees this natural process needs to be supplemented with artificial aid. This is especially true of the White Pine, on which the dead branches are very persistent. One sometimes sees thick Pine woods fifty years old or more with dead limbs clinging to the trunk nearly to the ground, thus showing that they have never shed many even of their first little branches. Every Pine branch starts a mere point from the heart of the tree and makes, as long as it lives, a fast red knot of increasing size in the timber through which it grows. But when a limb dies its annual increase of course stops, while that of the trunk around it goes on, so year by year the wood of the trunk grows out over the dead limb, often leaving a space between the live wood and the dead, thus making from the point where it died a loose black knot set in a constantly deepening hole. Dead limbs, therefore, even more than live ones, spoil the quality of timber, and superfluous branches should accordingly be pruned off as soon as they die, if not before. Then if the cutting be properly done the bark will soon close smoothly over the wound, leaving only a small knot near the heart of the tree and clear timber outside. Pruning, indeed, both natural and artificial, is perhaps the most important factor in the production of a good, as well as a large, timber crop, since every side branch means a knot of corresponding size in the trunk from which it springs, and the earlier the branch is removed the smaller will be the knot and the less the amount of timber affected by it. Close planting is valuable also for the protection and support thus afforded by the trees to one another as well as for economy of space. But as the trees grow larger they interfere so much with one another's light, air, and space that the seedlings die in great numbers. Then as the survivors increase in size the weaker trees continue to be killed by the encroachments of the stronger or more rapid growing. This killing out of weaker trees by close crowding is called natural thinning and like natural pruning plays a most important part in the development of a timber forest. But the struggle is so great that all the trees suffer more or less and the growth of even the

strongest is retarded, and sometimes the whole woodland becomes stunted and sickly, since rapid growth is necessary to make the best timber. So here again man must lend a hand, helping to thin out the weaker trees and removing everything that can interfere with the development of the best. The process of thinning calls for some degree of care and judgment, but intelligent observation and experimental practice will quickly educate even the inexperienced.

These same principles underlie the treatment of old uncared-for woodland. Suppose a farmer wishes to improve his wood lot, containing White Pine of different ages with a mixture of other growth. First, the other wood should be removed, as fast as no longer needed for support or protection to the young Pines, though sometimes in the case of valuable species mixed timber may be grown very successfully. But every inferior tree should be weeded out as carefully as one would weed potatoes or corn. Then most of the old Pines should also be removed, unless these too are needed awhile for protection, for if Pines have not been thinned and pruned while small it hardly pays to spend time and labor upon them as so much timber is likely to be already knotty and poor. But care should be taken to leave seed trees here and there in order to secure natural reproduction, for it is cheaper and better to depend as far as possible upon natural reseeding rather than planting. Only the best trees should be left for this purpose since good stock to seed from is as important as good pedigree for calves and colts. Planting should be necessary only in foresting waste land or in filling gaps in the natural growth. While clearing out the old and inferior growth from the wood lot the remaining trees, the crop to be cultivated, should be thinned and pruned and all thin or bare spots filled in by planting or natural seeding. A natural woodland properly managed should more than double its value in twenty years, when many of the largest trees will be ready to cut at a good profit, while the wood taken out meanwhile by weeding, thinning, and pruning yields just as good a return as though cut in the ordinary way, merely for its own value.

To sum up:—Rapid, healthy, vertical growth makes the best and the most timber. To this end trees should come up very thickly and then be thinned and pruned as they need more light,

air, and space. If, on the contrary, they come up too far apart, they grow branching and bushy, making the timber short, small, and full of knots. Some trees need or bear more shade than others and all need more in their early growth than later. Close crowding during the first forty or fifty years kills off side branches producing tall, clean trunks and clear straight-grained timber free from knots, and it also kills out the weaker, poorer trees; but too close and long-continued crowding stunts and injures the whole forest. Killing side branches by crowding is called natural pruning. Killing out the weaker trees by crowding is called natural thinning. The main problem of forestry is so to balance these processes and to supplement them with artificial thinning and pruning, natural reseeding and planting—in other words, so to direct and assist nature, "as to produce and reproduce the largest amount of the most useful wood on the smallest possible area with the least expenditure of labor and money and the least interference with natural conditions."

Timber should not be harvested too soon or remain standing too long. Every tree has its period of growth, maturity, and decay. From an æsthetic point of view maturity may mark only the beginning of a tree's highest value, but as timber it ought not to stand beyond that period and would probably be better cut before. For some purposes young timber is desirable or necessary, while for others it should attain its utmost growth. For instance, Willow sprouts for gunpowder can be cut once in eight or nine years; White Pine is best for match wood about eight or ten inches in diameter; and Chestnut will grow good telegraph poles in thirty years; but for construction timber the largest trees are almost always the best. Other things being equal, there is much more profit in large trees than in small ones. A man of long experience and observation in timber raising tells me that he once asked a careful and experienced lumberman who had been cutting down a lot of trees, large and small, to estimate the cost of taking from the standing trees enough of his smaller logs to make one thousand feet of manufactured lumber and putting it upon the market. The lumberman was greatly surprised to find by his own figuring that his small logs would not, when put upon the market as manufactured lumber, bring what he would have paid out upon them. He had not only lost his young trees, each

one of which, by standing longer, might have produced more than a thousand feet, but it cost him good money to get rid of them. It costs comparatively little to put one thousand feet of lumber on the market if it comes out of one tree, and it brings a high price, but it costs a great deal more per thousand feet when it takes thirty, forty, or fifty trees to make that amount, and this small lumber sells for a very low price. Indeed, the simplest and most elementary forest management consists in cutting only the trees of sufficient size, leaving the smaller ones to mature in their turn, instead of clearing the land and perhaps letting it be burnt over and sold for taxes. After woodland has been brought under proper cultivation as exact an estimate can be made of the annual or periodic crop of wood to be expected from one piece of land as of potatoes or wheat from another,—more exact, indeed, as trees are of course far less dependent on one season's weather.

In the United States comparatively little has yet been done in the line of thorough, systematic forestry, though many good beginnings have been made in almost every section of the country. Even lumbermen are waking up to the necessity of harvesting their timber with an eye to the future. Small farmers are perhaps the last to realize the advantage of cultivating the timber they have and planting more, but an increasingly large number are beginning to do it or to seek information on the subject; still others are open to conviction, while a few have already managed their woodland on common sense principles long enough to prove the superiority of such methods. Of these last Mr. Fred A. Cutter of Pelham, New Hampshire, is an excellent example. I go out of our own State because I do not know where to find just the same work in Massachusetts and my object is to show not merely what is done at home but also what might and ought to be done here. Pelham being just over the Massachusetts border presents conditions identical with our own. The most valuable feature in Mr. Cutter's operations seems to me to be their combined simplicity and effectiveness. They require no long training nor even much experience, and but the smallest outlay of capital and labor. There is nothing in them that any farmer cannot put into immediate practice on his own wood lot with the prospect of eventually doubling his profits and even in many cases beginning to get considerable returns in from ten to twenty years.

Mr. Cutter's woodland is a part of ninety acres taken up by his grandfather in 1792. It was then covered by a heavy growth of Oak with a few stray Pines here and there. About 1816 this timber was all blown down in a gale. Sixty-six years ago Mr. Cutter's father moved from Brookline, Massachusetts, back to his native home, where he put up a large set of buildings for which he had to buy the timber, as there was no Pine on the place except a few trees mixed with the Oak which had grown up after the blow-down. The Oak was cut down and from those scattering Pines a tract of forty acres was thickly seeded, nearly all of which has been thinned and pruned. Fifty years ago they began pruning perhaps an acre a year and thinning as needed, and now from the forty acres have been already cut 700,000 feet of timber, while about 300,000 feet are still standing. It is estimated that the timber already cut has netted more than ten thousand dollars clear profit and that two thousand dollars' worth remains which is increasing in value every year. Mr. Cutter harvested his best timber, which brought from $150 to $200 the acre standing, five years ago. From one square rod he cut 2800 feet, for which he received twenty-eight dollars delivered in logs. On one lot containing trees fifty-five years old seven-eighths of the trees made logs sixty-four feet long, the timber completely free from knots outside a small space near the heart where the limbs were sawn off and many of the trees sawed one thousand feet and upwards of clear timber. Upon the ground cut over five years ago Pines are thickly seeding in from the seed trees left for reproduction. To illustrate how closely Pines may come up to advantage, on one lot now covered with fine young trees ready for the second thinning and pruning the saplings were so thick before the first thinning that by actual experiment among them one person could not see another at a distance of eight feet. Mr. Cutter's large Pine now standing is worth from $75 to $125 the acre, according to size and to the attention that has been bestowed upon it, and will be worth more when ready to cut some years hence. He thinks that Pines should not be thinned and pruned until fifteen or twenty feet high, believing that not until that time will nature have fully shown which are the fittest to survive, and that up to that size no knots develop sufficiently to injure seriously the general quality of the timber. He always prunes with a saw, never

with an axe. I call special attention to these points because later I shall describe successful timber culture by quite different methods. At the first pruning Mr. Cutter trims only within reach standing on the ground, or as far up as there are any dead limbs, and thins by selecting the poorest and weakest to cut out. The remaining trees then shoot up and make much more rapid increase in height and volume than before. The second thinning and pruning are done ten or fifteen years later. This time the pruning is done from a ladder and in thinning only the dead or dying trees are cut out. Mr. Cutter estimates that the first thinning and pruning costs about five dollars per acre and that the second pays for itself in the wood taken out. So all that is made by the operation over five dollars an acre is clear profit. One who deals with trees always with an eye to their best development acquires a keenness in seeing the possibilities, æsthetic or economic, of even a single tree, utterly lacking in the man who lets his wood grow up haphazard, with no love for the trees and without a serious thought for their welfare, and harvests it in the same way. While cutting off a heavy growth of Pine Mr. Cutter came across a fine little Oak which the woodman was about to cut down and which would have been good for nothing but a few sticks of firewood. But Mr. Cutter told him to let it stand as it could do no harm and might be wanted sometime. Freed from the shade of the Pines it grew rapidly and twelve years after when the Pine saplings were growing up thick around it, a man came along who said, "There is just the tree I have been looking for to make a post for my cider mill!" He paid Mr. Cutter twelve dollars for ten feet of the trunk and cut it himself, while the rest of the tree netted ten dollars for cord wood. There was twenty dollars clear gain from a tree that would otherwise have been thoughtlessly cut down and which cost absolutely nothing to grow. The great advantage of tree culture on a farm is that trees grow and flourish, silently rolling up the profits, not only while the farmer is sleeping but while he is doing and earning quite as much in other lines, for land can be utilized for trees which is worth little or nothing for anything else, and the work of planting, thinning, and pruning can be got in at odd times that hardly count at all. About thirty years ago a man and his young son went out one rainy morning and set out on a sandy knoll of half an acre or so

some White Pine seedlings taken from an adjoining piece of land. The ground planted was worth about three dollars; the labor of setting out, thinning, and pruning might be four dollars, the whole amounting, with interest in thirty years, to perhaps sixteen dollars. The trees are now valued at forty dollars on the stump, which would seem a pretty good return on so small an investment. Given twenty years longer they will be worth much more and with a larger outlay of labor their value might probably have been still further increased. The land from which this man took his seedlings was at that time covered with a heavy growth of young Pine. This has now been cut off, the last cutting having been finished about four years ago. There were taken off 700,000 feet of timber bringing $3,500 on an investment of $300, and the land still left. It is now covered with a thick growth of seedling Oak which with suitable care would make fine timber for some uses in twenty to thirty years, while with more time its value would increase proportionately.

The White Pine land of Mr. Nathaniel Morton, of Plymouth, Massachusetts, affords an excellent example of good forestry based on the same general principles as Mr. Cutter's, but carried out in detail by different methods. Nine years ago Mr. Morton bought for four hundred dollars fifty acres of woodland near Plymouth. The sandy soil was then covered with a mixed growth of White Pine and sprout Oak, the Oak being usually the more abundant. From this tract the previous owner had almost yearly for many years been cutting out the best firewood. But Mr. Morton wanted to raise Pine, so he began at once to remove all the Oak that interfered with or shaded too much the young Pine, while yet leaving enough to protect the ground, and so encourage the sprouting of the Pine seed with which the soil was well supplied, and also to shade the seedlings as long as needed. The Pines, however, after passing the seedling stage, have seemed to to do best on ground from which all the trees had been removed and Mr. Morton now questions whether the huckleberry and other low growth would not have furnished enough shade for seeds and seedlings if all the Oak had been cut off at once. Mr. Morton's pruning differs from that of most Pine growers in several particulars and he has by independent experimentation reached many of the same conclusions as Des Cars and other eminent authorities.

In describing his methods I shall make large use of his own words but as these will be connected and supplemented by my own, quotation marks will be omitted.

In dealing with his Pine Mr. Morton began by trimming off all dead branches as high as could be reached from the ground with an axe, and occasionally cutting live limbs also to the same height. His method for the first four years was to prune the limbs as closely as could be done without injury to the bark of the trunk, but sometimes the cut would accidentally extend into the trunk, and in smoothing the wound some bark would be removed all around the cut. In a few years it was found that the scars made by limbs thus cut off had become partly or wholly covered with new bark while the scars made without cutting into the bark of the trunk had not healed over and showed little or no signs of doing so. Most of Mr. Morton's pruning for the last four or five years has been done on the plan of cutting into the trunk enough to make a scar about twice the diameter of the limb taken off and cutting deep enough on all sides of the limb to be sure to cut through the inner bark of the trunk, for if the bark on any part is left unbroken it will not close in upon that side and longer time will be needed to cover the wound with new bark. Live limbs of all sizes up to three inches in diameter and some even larger ones have been cut off in this way and the scars give promise of becoming entirely covered with new bark. All his trees five feet high and over have had one or more rows of the lower limbs pruned off, the plan being to continue such trimming yearly until all limbs have been removed to the height of twenty feet or more, always leaving enough top limbs to promote the best growth of the tree.

It will be seen that the chief peculiarities of Mr. Morton's treatment as he has worked it out up to the present time consist, first, in pruning branches close to and even with the trunk and then smoothing the wound by cutting all around well into the trunk bark, and, second, not only in pruning off live limbs as well as dead ones, as he has done upon the older Pines, but also in pruning trees so young that there are only or mainly live limbs to prune; in other words he forestalls the process of natural pruning by pruning himself before nature has a chance to get in her work at all. We shall have occasion to return to these points later in speaking of the pruning of shade trees. Mr. Morton's Pines,

as he is himself careful to state, are too young for one to speak with absolute certainty of final results but everything promises remarkable success. Experiments show that wounds made by pruning small branches as carefully as possible in the usual way have not nearly healed in five years and the tree has in some cases grown outward around the scar, leaving holes in the trunk, while other wounds made on the same tree in pruning similar branches by cutting into the bark on all sides even with the trunk have closed smoothly over in three years. Also trees pruned before the branches begin to die naturally show better growth than those on which artificial pruning is used only to aid or supplement the natural process. As to general results thus far one has but to compare Mr. Morton's Pines with woodland across the road exactly similar to his own when he began work upon it nine years ago. The one tract is covered by sprout Oak with a few poor Pines and sickly young seedlings, dying for lack of chance to grow. On the other is a sturdy growth of vigorous young Pine of various sizes with clean straight trunks and healthy tops, and on this piece the wood bulk has increased fifty per cent in seven years, that is, since clearing out the Oak and giving it a fair start. Mr. Morton prunes almost wholly with axe and knife—a large knife for cutting live branches up to about an inch in diameter and a thin sharp axe for cutting and smoothing all other limbs. For working on or near the ground he uses a long handled axe and for trimming upper limbs one with a short handle. The pruner should carry a whetstone to use many times a day, as a dull tool is likely to injure the tree. Mr. Morton is doing a variety of experimental and observational work with trees, both individually and in the mass, the results of which are watched with interest by experts.

Both Mr. Morton and Mr. Cutter are very glad to show their woodland to visitors and to answer any questions as to methods or results.

II. *Roadsides.*

We have thus far been discussing trees only in woodlands and from a pecuniary standpoint. Forests of course possess also as great economic importance in other directions, as in their products and the profits to be derived from them, while to many of us their spiritual values of beauty and sublimity and inspiration

make the strongest appeal of all. But I have held myself strictly to a basis of dollars and cents, because under our present organization of society few can or will cultivate woodland, or even let it stand very long, without assurance of a sufficient tangible return.

It has been truly said that "if the forests should disappear civilization would become extinguished on the earth." The same could perhaps hardly be said of street and roadside trees and other growth, and yet a state of society which destroyed or deliberately discouraged or even failed to encourage all such adornment would certainly need civilizing. In the consideration of forests, however we may value their beauty, economic factors must, as we have intimated, receive the main stress, but we cannot deal with roadsides without combining the two values, æsthetic and economic, and here the æsthetic must preponderate. The practical values are just as truly there as in the timber forest, in the health, comfort, convenience, and pleasure that all may enjoy from well shaded and adorned streets and roads; and health, comfort, convenience, and pleasure are just what above all else we want, if we can, to buy for ourselves with the profits of timber raising. The moment we look upon beautiful streets and roads as one of the comforts of life necessary to be provided for everybody the problem will be solved and our civilization will have made a large advance.

We have time merely to touch upon a few points of roadside treatment, some of which might easily furnish the subject of an entire lecture. For convenience, since they require different treatment, I will speak separately of city or village streets and country roads, and shall confine myself almost wholly to the question of protecting and fostering the growth that we already have or that nature supplies when we let her do so.

The most obvious protection needed by street trees is from external injuries. It is almost worse than useless to plant fine trees only to allow them to be killed or injured by the gnawing of horses, the grazing of wheels, or the assaults of thoughtless boys and other persons. Every small tree and all large trees in exposed positions should be guarded, though large trees usually need guarding only on the side toward the street. Guards should be of strong-meshed wire, not "chicken wire;" be fastened securely, but not tightly enough to bind, and be

enlarged with or in advance of the growth of the tree. It is poor economy to put on a guard low enough for horses to reach over; the guard should be six feet high unless the tree is so small that this would interfere with the lower branches, in which case the tree should have, if possible, a protection wide and strong enough to keep enemies at a respectful distance. Sometimes a tree, especially a Rock Maple, is liable in swaying to chafe against the top of the tree guard. This is easily and most effectively prevented by tying two soft stout strings at right angles to each other near the top of the guard, which should be considerably larger than the trunk, then passing the strings on either side of the stem through the wires opposite and returning to the points of starting and there fastening. This stringing will usually last a whole season and may not be needed the following year when the tree has become firmly established. Many devices have been tried by the Brookline Town Forester but this has proved in every way the best. The wire for tree guards recommended by the Massachusetts Forestry Association is called No. 1-16, the best widths thirty-two and seventy-two inches, net price at wholesale about four cents a square foot, and should be attached by copper wire which stretches as the tree expands. Through the influence of the public spirited Roxburghe (Woman's) Club in Roxbury, nine thousand street trees have recently been guarded and Mr. Doogue will soon begin work on the smaller trees. Mr. Doogue has also promised to give one thousand trees to the Roxburghe Club this spring to be distributed by them among those persons who will plant and care for them. This Club had about two hundred trees planted two years ago and sets an excellent example in taking quite as much interest in guarding and otherwise caring for trees as in planting them.

From injuries by electric wires there seems to be little hope of complete protection until all wires are buried, but something can even now be done by strict supervision and by holding corporations owning the wires responsible for all maltreatment. Damages have been and can be recovered for injuries of this kind. Of protection from insect pests and from disease there is here no time to speak except to give an incidental hint here and there in connection with other matters.

There are few ways in which shade trees receive more serious

injury than from bad pruning or the lack of pruning. We have seen that the pruning of all forest trees, beginning when they are saplings, is a most important factor in the production of good timber. The pruning of every shade tree is not in the same way a matter of course necessity at any particular period of its life, yet every shade tree is practically sure at some time to stand in greater or less need of surgical treatment. The pruning of timber trees consists mainly in taking the lower limbs off successively as the tree develops, in order to increase growth at the top, thus producing tall straight-grained trunks. Street trees may need pruning at any time from early youth to extreme old age and for a variety of causes which can be summed up under two heads :— First, in order to improve or modify the shape of a tree for the sake of greater beauty or convenience or for a more healthy growth. Second, to guard against or to cure decay, disease, or deformity.

The first object of pruning, to improve the shape of a tree, is not intended to mean the production of any stiff, formal effects but only to restore or train a tree to its normal outline by correcting tendencies toward exaggeration or by repressing or shortening sportively inclined branches that injure its natural symmetry. For instance, the spreading Oak may spread so far that the lower branches become disproportionately large at the expense of the upper ones, which may consequently decay, while the heavy lower limbs are apt to be broken by wind or by snow and ice and the whole tree thus loses not only beauty but also health and perhaps life. Or one or two branches may protrude so far beyond the outline of a round or pyramidal tree as to mar greatly the general effect. Such branches need cutting back enough to conform to the natural shape of the tree. Besides the disfigurement they cause, these unruly branches are also apt to be broken by wind or storm, thus endangering health as well as beauty. Many street trees need higher trimming for the convenience of passers by and of vehicles, and for the sake of more light and air and a higher view.

Second, how, taking our trees as they are, shall we by right pruning guard against or cure disease and decay? To begin with, cut off all dead or dying limbs, which carry death back into the tree itself. All branches, too, which chafe or cross should be

removed, for their bark becomes broken and they cannot remain sound. Broken branches and stubs, remnants of limbs of any sort, and all sprouts upon the trunk and unsightly protuberances should be pruned off. Wounds, cavities, and loosened bark all invite disease and insect pests, and need immediate treatment.

But if we stop here half the story has not been told. More really depends upon the manner in which it is done than upon the pruning itself. Indeed many persons interested in trees object to pruning for the very reason that it causes decay and disease. Lumber dealers especially are often opposed to pruning and are inclined to reject pruned logs. But it is the method and not the fact of pruning which is at fault. Go through almost any town or village in Massachusetts, even where some pains are taken to preserve the trees, observe the pruning and its results and you cannot fail to be convinced that bad pruning is responsible for the deformity, decay, disease, and death of large numbers of our street and roadside trees. Ugly protuberances, scars left by old wounds never or badly healed, dark cavities lined with fungous growth and rotting into the trunk, stumps of branches cut off anywhere from two or three inches to as many feet from the trunk or limb to which they belong, and shrunken and decayed according to the length of time they have been cut, loosened bark furnishing breeding places for insect enemies — some or all these and other forms of evil will one be likely to find on most trees of any size, especially on mature trees which ought instead to be in the prime of perfection and beauty. Nearly all such evils are the consequence of bad pruning, and it is bad pruning which has brought all pruning into disrepute and is really almost worse than none at all.

But what makes any pruning good or bad and why? The main principle on which the whole result depends is the same that Mr. Morton discovered by accident and careful observation and confirmed by experiment, and can be expressed in a single rule, namely:— In pruning remove every branch, large or small, living or dead, by cutting it off close to and perfectly even with the trunk or limb from which it springs. This necessarily involves cutting into the live bark around the wound and in this way only, especially on deciduous trees, can rapid and complete healing be effected. The reason for this will be at once obvious to one who

understands the process of wood formation. Sap forms wood or bark only on its return journey from leaves to roots. Therefore, no wound can heal unless its edges — that is the live bark around its edges — are in direct communication with leaves through the returning sap. But when a limb is cut off at any distance from the trunk the wound cannot be reached by sap because there are no leaves beyond to lift the ascending sap in that direction or to elaborate it into wood and bark-producing material and send it back to repair damages. The stub therefore dies and gradually decays down into the tree, producing eventually one of those dangerous cavities which I have mentioned. When properly done trees bear a surprisingly large amount of cutting without injury. It is perfectly safe to cut off at least one-half of the trunk circumference in bark and sometimes two-thirds when the tree is thrifty.

As to the best season for pruning, authorities differ except in the case of Maples and coniferous trees, which should never be cut while the sap is running. Summer is the best season for these. Besides the pruning of branches, protuberances on the trunk, ofter caused by trimming near to but not even with the trunk, should be cut off smooth in the same way as pruned limbs, and all cavities should be thoroughly cleaned out and filled with elastic cement or with small stones and then covered with the cement. There are many very important but simple and common sense details which should be observed in pruning, but which must here be omitted except to add that on all shade trees the wounds made by pruning should be immediately covered with a coating of paint or coal tar — tar is better — in order to protect the exposed wood-cells from insects and decay. On coniferous trees, like Pines, the resin or pitch answers to some extent the same purpose, especially in the shade of the forest, where, besides, it would be impracticable to tar every wound. But resinous trees growing in the open and, therefore, exposed to sunburn and other dangers would better have their wounds dressed like any other shade or ornamental trees.

The reason why so much bad pruning is tolerated is partly because few people know that it is bad, seeming to regard most blemishes on trees quite as much a matter of course as the falling of autumn leaves. Besides, pruning properly performed takes four or five times as long to do as poor pruning and when the

same price can be obtained men professing to be experts injure beautiful trees by poor work, presuming on the ignorance of the owners. Pruners about whose fitness or responsibility there is any doubt should never be employed on streets or private grounds. There are competent concerns who do thorough work and who take contracts in any part of the State, but everyone should learn the elementary principles of pruning in order to know when it is correctly done. "Tree Pruning" by A. Des Cars, translated from the French by Professor Charles S. Sargent, and "The Pruning Book" by Professor L. H. Bailey are the best available works on the subject. They are interesting as well as instructive even to one with no previous knowledge in such matters.

Country roadsides may be shaded and beautified with much less expense and trouble than city or village streets by taking advantage of that wealth of spontaneous growth which almost every roadside produces when let alone. In the indiscriminate mowing of roadsides which so generally prevails, many a fine seedling or sapling is cut down that would in a few years become a noble tree, a comfort and delight to every passer by. In cities and villages it is undesirable to use trees of different kinds on the same street or short section of a street, but on country roads a mingling of species is often very effective. Neither should trees always stand in rows or be evenly spaced, and occasional wide breaks in the line of shade on one side or the other of the road make pleasing contrasts, especially when disclosing broad or distant views. The natural roadside tree growth can often, therefore, be utilized to a large extent with very little additional planting. Trees of any size often do not need guarding unless in exposed positions and many trees can be guarded by bushes, or by inexpensive improvised wooden guards large enough so that stakes driven into the ground will not injure the roots of young trees. Such guards — as also fences and walls — can be disguised and beautified by vines and other plants. Roadside trees even more than street trees should usually be trimmed high, not only for the admission of light and air and convenience of passage, as in the case of loads of hay, but also to afford unobstructed views of the surrounding landscape. Mr. Morton, besides his cultivation of woodland, is devoting considerable time and thought to directing and improving the natural tree growth upon highways adjoin-

ing his land and that of others interested in his operations, which promise great success.

Other roadside growth should receive the same thoughtful artistic treatment as Mr. Morton is giving to trees, and this can be done at the expense of less time and trouble than trees require. The endless groupings and combinations of nature are varied and graceful beyond any possibilities of artificial arrangement and can be altered or modified and mistakes repaired almost at will, owing to the rapidity of roadside shrub and plant growth. We have doubtless all had the experience on our visits to the country of driving or walking a long way for the sake of enjoying a certain "pretty road," and of avoiding another walk or drive because of barren, ugly roads. But why have any roads ugly or barren? Why not make them all beautiful or let them become so, not with tiresome sameness —though which is worse, monotonous beauty, if there is such a thing, or monotonous ugliness?— but with Nature's own graceful profusion and variety, restrained, interrupted, modified, if you will, by the hand of man, but always fresh and pleasing.

In speaking to the Horticultural Society last year I mentioned reasons that had been given me for opposition to tree and shrub growth upon country roadsides. The chief of these reasons was that such growth, especially bushes, causes snow drifting. After a somewhat extended investigation, I find that with very few exceptions all the bad drifting places are on barren open pieces of road where there is no roadside growth at all. When drifting does occur habitually between overgrown roadsides it seems usually to be on roads running north and south, while east and west roads presenting apparently the same conditions in other respects do not drift at all, and it is by no means certain that the north and south roads would not drift just the same or worse with the bushes all cut off. Pines and other evergreens are greatly complained of as roadside trees because of keeping the road icy, unsettled, and muddy late in the spring. But here again it appears to be wholly a matter of location. Pines on the north side of a road protect from cold winds and retain the heat of the south sun, thus causing mud and ice to disappear more rapidly than elsewhere, while on the south side they keep off the sun and let in the wind producing exactly the opposite effect. The result in either case is modified

by high trimming, which is almost always advisable except in the case of certain evergreens, and occasionally other trees, in some location where a hedge-like effect is desired. Nothing in roadside adornment produces a more stately and magnificent appearance than a long row of tall, well spaced, and high trimmed Pines. They grow easily and quickly and should be used much oftener than at present. Nut trees also, both on streets and roadsides and in orchards, are deserving of much more attention than they now receive, and the objections to their cultivation or toleration can be far better met than by cutting down beautiful and valuable trees. I notice in the "Old Farmer's Almanac" for 1900 some excellent advice on "Growing Chestnuts and Shellbarks for the Market;" also suggestions for "Trees and Shrubs around the Dwelling House."

There is happily in Massachusetts a growing sentiment in favor of utilizing natural roadside growth instead of mowing it down, but the work of Village Improvement Societies has thus far seemed to be confined almost wholly to village limits. In fact it is not uncommon to find large portions of a road between two beautiful and well-kept villages not only robbed of every natural charm but even disfigured. If these organizations would take hold of country roads with the same zeal and judgment that they have in many cases applied to the improvement of streets, a few years would see a vast increase in the rural attractions of our State.

The work of educating public opinion on the subject of a more healthy and beautiful street and roadside growth is one to which women's clubs seem particularly adapted, always providing that they act as does the Roxburghe Club, only upon thorough knowledge and in hearty coöperation with street commissioners, tree wardens, and other officials. Most women have more daytime leisure than most men to observe the condition of streets and roadsides, and their organization into clubs gives them greater influence and better facilities for systematic study than they would usually gain as individuals.

Another and the most powerful agency for improving the present state of things lies in the training of children and youth. Not that I would add one iota to the already over-full curriculum of our schools. I would make room by taking out those subjects

like mathematics—beyond the simplest elements—valuable in themselves and in their proper place, but now crowded prematurely upon the primary and grammar grades, and by abolishing methods such as waste so much time, for instance, in the present study of English. Nature study is a long step in advance, especially when it includes gardening. But why not go farther and take up the elements of arboriculture and forestry, and do it in the most concrete and practical manner? No amount of abstract teaching can half so well fix upon the minds of children the circulation and functions of sap, for example, as to see it illustrated in good and bad pruning. As soon as they are old enough, let them take a hand themselves at pruning in a small way as part of manual training. Set them also to observing the defects and possibilities of street and roadside trees and other growth in their neighborhood, and they will prove themselves most valuable investigators and helpers as they have already done in some places by collecting and destroying the egg clusters of the tent caterpillar and other insect pests. Take them to the nearest available woodland for illustration of timber growth and forest functions. Educate the children on proper lines and we shall not have to cut down nut trees to save them from mutilation. Let children become interested under suitable direction in street and roadside, in timber raising and forest preservation, and the next generation will live in a better and more beautiful world than ours. Besides, I believe that early training in such far-reaching work as tree culture and forest management has a distinct value in broadening and humanizing mind and character. Familiarity with aims and efforts for definite, practical future good which must often benefit others rather than one's self cannot fail to have that effect. So let us devise some plan for training our children whereby they can work together with nature in her free and open laboratories, study her methods and feel the pleasure of assisting in their development, with an eye like hers—if unconsciously, perhaps so much the better for a while — an eye to future men and future times.

BUSINESS MEETING.

SATURDAY, March 3, 1900.

An adjourned meeting of the Society was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

Ex-President William C. Strong spoke of the exhibition of carnations, open at the Flower Market under Park Street Church, and of the desirability that so beautiful an exhibition should be held in Horticultural Hall, and moved the appointment of a committee of three to confer with the organization under whose auspices the exhibition was held, in regard to bringing the next exhibition to the Society's Hall. The motion was carried, and the Chair appointed as the Committee Mr. Strong, William H. Spooner, and Patrick Norton.

Henry L. Clapp made the following motion:

That half-tone cuts, not wider than the pages of the TRANSACTIONS, be made from photographs of President Francis H. Appleton, Vice-President Benjamin P. Ware, Secretary and Librarian Robert Manning, Ex-Presidents William C. Strong and William H. Spooner, Joseph H. Woodford, O. B. Hadwen, and Mrs. E. M. Gill, all members and pillars of the Society, and that our TRANSACTIONS this year be embellished with prints from such cuts; and further, that a short account of the principal incidents and works in the lives of these members be printed with the pictures in our TRANSACTIONS, and that additions be made to the accounts according to the discretion of Secretary Manning, who knows all the members well.

The above motion was referred to the Executive Committee.

The following named persons, having been recommended by the Executive Committee as members of the Society, were on ballot duly elected:

HENRY BROOKS, of Lincoln.
JAMES DONALDSON, of Boston.
FERNALD E. HAM, of Burlington.
FRANKLIN HAVEN, of Boston.
WILLIAM W. HOLT, of Winchester.
THOMAS ROLAND, of Nahant.

The meeting was then dissolved.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, March 10, 1900.

A meeting for Lecture and Discussion was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

The following lecture illustrated with stereopticon pictures, some of which, selected by Mr. Ward, are reproduced here, was delivered:

THE IMPROVEMENT OF CARNATIONS IN AMERICA.

By C. W. WARD, Queens, N. Y.

Our Carnation, *Dianthus Caryophyllus*, erroneously called Pink by many people, is a native of Southern Europe. In its original state it is a half-hardy herbaceous perennial, growing about two feet in height. The original flower was flesh colored and contained five broad petals. Its natural period of blooming in the open air is from June to August. It is said to exist in the wild state in England where it was introduced supposedly about the time of the Roman invasion. As long ago as three hundred years B. C. the Carnation was described by Theophrastus, who gave it the name Dianthus, from the Greek *Dios*, divine, and *Anthos*, flower. The name Caryophyllus was undoubtedly taken from the clove tree, *Caryophyllus aromaticus*, and was applied to the Carnation because of the clove-like fragrance of its blooms. The name Carnation, derived from the Latin *carnis*, flesh, refers to the flesh-colored flowers of the original type. The Carnation has been in cultivation for more than two thousand years, and in early Greek history is mentioned under the name of Gillyflower. As early as the beginning of the sixteenth century the development of the Carnation began to attract the notice of historians, and the European gardeners contributed so many varieties that Gerard in 1597 wrote that to "describe each new variety of Carnation were to roll Sisyphus' stone or number the sands."

The Carnation has been divided into several distinct classifications. The French arranged all varieties in three classes, the Grenadins, Flamands, and Fancies. The English divided them into four classes: Selfs, comprising only one color in the petals; Flakes, having a pure ground of white or yellow and flaked or

striped with one color; Bizarres, having a pure ground color but marked with two or three different colors; and Picotees, the last, having a pure white or yellow ground, each petal being bordered with a band of yellow at the margin. The English still maintain this classification and in the twenty-second annual report of the National Carnation and Picotee Society, Southern Section, of England, we find a total of forty-two classes described in their premium list, covering the above four classifications.

In the early part of the nineteenth century the English gardeners paid particular attention to growing Carnations and produced fully as large flowers as any that we have upon the table here today. They practised what is known among English gardeners as dressing, removing all imperfect and superfluous petals with forceps and arranging the remaining petals in a perfectly formal manner. Frequently the calyx was cut down between the points to prevent what is known as bursting; that is, the growing out of the petals at one side of the calyx. All of these artificial details seem to have proved of doubtful benefit to the Carnation, and eventually to have wrought its downfall, as we find that from about the middle of the nineteenth century little is heard of the Carnation among English gardeners, until within a comparatively recent period. The type of the Carnation, however, that was developed and grown by the English gardeners, is not the same type that we grow at the present time; but it is distinctly a race of summer flowering Carnations. The usual plan of growing them is to keep the plants in cool houses or cold frames during the winter and to bring them into blooming quarters in the early spring. They were usually had in perfection during the months of July and August, each plant producing a profusion of blossoms during this short season. While the English seem to have lost much of their interest in the Carnation about 1850, that interest seems to have been steadily reviving during the past few years.

Referring again to the annual report of the National Carnation and Picotee Society, we find that there is a total of three hundred and nineteen premiums offered in the forty-two classes and that this society is supported by a list of three hundred and eighty subscribers, who have donated sums ranging from five shillings to fifty pounds each towards maintaining its premium list, these donations amounting to three hundred and seventeen pounds

sterling, or about $1,500. We also find that this report contains as patronesses the names of Lady Ardilaun, Baroness Burdett-Coutts, the Duchess of Marlborough; and as patrons, Lord Balfour, Lord Henry Grosvenor, Lord Rothschild, and Baron Schroeder, and many other prominent persons. Among its Vice-Presidents is found Sir John T. D. Llewelyn, member of Parliament. The mention of these names will give some idea of the present interest shown by English people in Carnation culture.

In America we have also the American Carnation Society, a national body devoted to the improvement of the Divine flower. This Society is composed of a membership of upwards of three hundred, the majority of whom are either Carnation enthusiasts or engaged in the cultivation of the Carnation either commercially or as amateurs. The work of this Society has been of incalculable benefit, and to its efforts may be largely attributed the advancement which has been made in the American Carnation. This Society holds its annual meeting in February of each year at different points throughout the United States, upon which occasions are exhibited magnificent displays of the finest Carnations that can be grown. The membership of this Society is open to any and all persons who are interested in or have any love for the Carnation. None are barred—amateurs and professionals are equally welcome.

The Carnation commonly grown in America was derived from the French strain, known as the remontant, monthly, or perpetual flowering Carnation. This distinct race originated about 1840 and is said to have been produced by M. Dalmais, a gardener of Lyons, France, the original variety, called Atim, having been sent out about the year 1844. This improvement was followed up in 1846 by M. Schmitt of Lyons, who produced several fine varieties that remained in cultivation a number of years.

M. Alphonse Alegatière was the next horticulturist to aid in the material development of this new race of Carnations, and he succeeded by skillful crossing in obtaining fine varieties with stiff stems. In 1860 the number of these varieties was largely increased and this class received the name of Tree Carnations; but in America they were generally termed monthly Carnations. It is from the productions of Alegatière that our American race of Carnations was undoubtedly obtained.

As early as 1866 a number of varieties were imported into this

country by Messrs. Dailledouze and Zeller, horticulturists, who were then located in Flatbush, L. I., — these gentlemen having imported Edwardsii, President Degraw, La Purité and a variegated La Purité. These varieties were grown during a period of ten years as pot plants for summer and winter blooming. It may be of interest to state that at the present time Mr. Charles Zeller, the survivor of the firm of Dailledouze & Zeller, still lives in Flatbush, a hale and hearty gentleman upwards of eighty years of age, and it has been my pleasure to hear him frequently declare that he was more than proud to have been one of the first who brought the Carnation to this country.

Mr. Zeller's partner, Mr. John Dailledouze, has long since passed away; but has left worthy sons who have succeeded to and preserved their father's love for the Carnation.

The work of improving the American Carnation has been taken up and carried on successfully by such men as the late Charles T. Starr and W. R. Shellmire of Avondale, Pa.; William Swayne of Kennett Square, Pa.; Joseph Tailby of Wellesley, Mass.; Sewall Fisher of Framingham, Mass.; Fred Dorner of Lafayette, Ind.; Fred Witterstaetter of Cincinnati, O.; Peter Fisher of Ellis, Mass.; the Dailledouze Brothers of Flatbush, L. I., and many others whose names are not now at my command.

The foregoing historical account of the Carnation I have gathered largely from the Cyclopedia of American Horticulture recently published by Professor L. H. Bailey of Cornell University.

Today it is my purpose to give you an illustration of the development of the Carnation from the original five petaled bloom to the four-inch flower of the present date. We find from the ancient descriptions that the wild Carnation was a five petaled flower about one inch in diameter and that it was commonly flesh or lavender colored. Fortunately among hybrid seedlings of today frequent reversions furnish us with flowers that are almost identical with the original type as it existed two thousand years ago, save perhaps in the matter of color.

In plate 1, figure 1, we have the original five petaled flower, but the color is a deep crimson. In figure 2 we have the first step towards the improvement of the flower, this being the addition of a single petal, producing a six petaled bloom. The next step is shown in No. 3, where three or four small, short petals have been added

PLATE 1.

Evolution of the Carnation
from a single to a double flower.

to the centre of the bloom, producing a semi-double flower. In the next step, No. 4, still more petals have been added and we now have a fairly double flower. The fourth step was made by adding still more petals, making a full, double flower as shown in figure 5; but you will notice that in all of these the relative size of the bloom remains the same, namely, about one inch in diameter.

After the Carnation hybridizer had succeeded in producing the double bloom shown in figure 5, his next aim was to increase the size of the bloom, improve the strength, as well as elongate the stem, and improve and diversify the shades of color. This has all been so faithfully done by our American hybridizers that you now have before you these magnificent blooms measuring from three to four inches in diameter with perfect calyxes and supported upon stiff stems two feet or more in length; some of them being equal in form to those produced by the artificial manipulation of the English dresser; embracing almost every tint of color known in flowers, save that of blue, and the approach towards this latter color is shown in varying shades of purple; several California varieties have been introduced in a distinct shade of mauve.

The study of this plate is decidedly interesting, as it shows the comparative difference between the Carnation as we know it today, and the original flower that aroused the sentiment and admiration of the ancient Greeks and Romans. This comparison is accentuated when we throw upon the screen Governor Roosevelt, a seedling four inches in diameter as the photographs from which these slides were made were taken of the same relative size. We shall also find in this bunch of seedlings before us a number of these single petaled blooms.

Possibly a brief description of the process of hybridizing may be of interest. If you will note figure 1 in the plate now thrown upon the screen, you will see projecting above the flower which has been split down, two horn-like growths. These are the pistils or female organs of the flower. In figure 2, where the petals and pistils have been removed, you will note the anthers which contain the pollen. In hybridizing, this pollen is removed from one flower and spread upon the pistils of the flower which we wish to bear the seed. This is done by tweezers or a camel's hair

brush, and in some instances by simply taking the flower and scattering the pollen over the pistils.

In figure 4 you will note that the flower has commenced to wither and the petals are closing together. This is an indication that fertilization has taken place.

Figure 5, where the calyx has been removed, shows the ovary or seed pod commencing to enlarge. After fertilization has taken place this pod continues its growth for four or five weeks and usually ripens its seed within six or eight weeks after the date of fertilization. Seed ripening, however, takes place much more rapidly in April, May, and June than during the winter months. After the seeds are ripened they are carefully sown and treated the same as the seeds of any choice greenhouse plant.

Again referring to figure 1 on the next plate, we have the seedlings shown immediately after the seed has germinated. You will notice that the embryo plant has scarcely any root, there being a slight suggestion of a root fiber; while in figure 2, which is taken three days after germination, the root system is distinctly shown.

In figure 3, taken a week or ten days after germination, the root system has reached considerable proportions and the first true leaves are beginning to form. When the seedlings reach the stage shown in figure 3 they are taken from the seed beds and pricked off into flats, where they remain three or four weeks and are then potted up in small pots, from which they are planted in the open ground from about the first to the tenth of May, where they come into bloom during the months of August and September, at which time the plants bearing promising flowers are lifted and planted on the greenhouse benches, and thereafter treated the same as in ordinary Carnation culture.

While this growing of seedling Carnations is an intensely interesting work and one well worthy of the careful attention requisite to obtain valuable results, it is not only tedious but expensive; and the seedling grower who produces a distinct advance upon the existing type of Carnation is well worthy of the plaudits of his fellow Carnation men and richly deserves the praise of all those who are interested in or imbued with the love of flowers.

In order to give an idea of the relative size, form, and build of the Carnations that have interested the American grower during

PLATE No. 15.

An Ideal White Carnation.

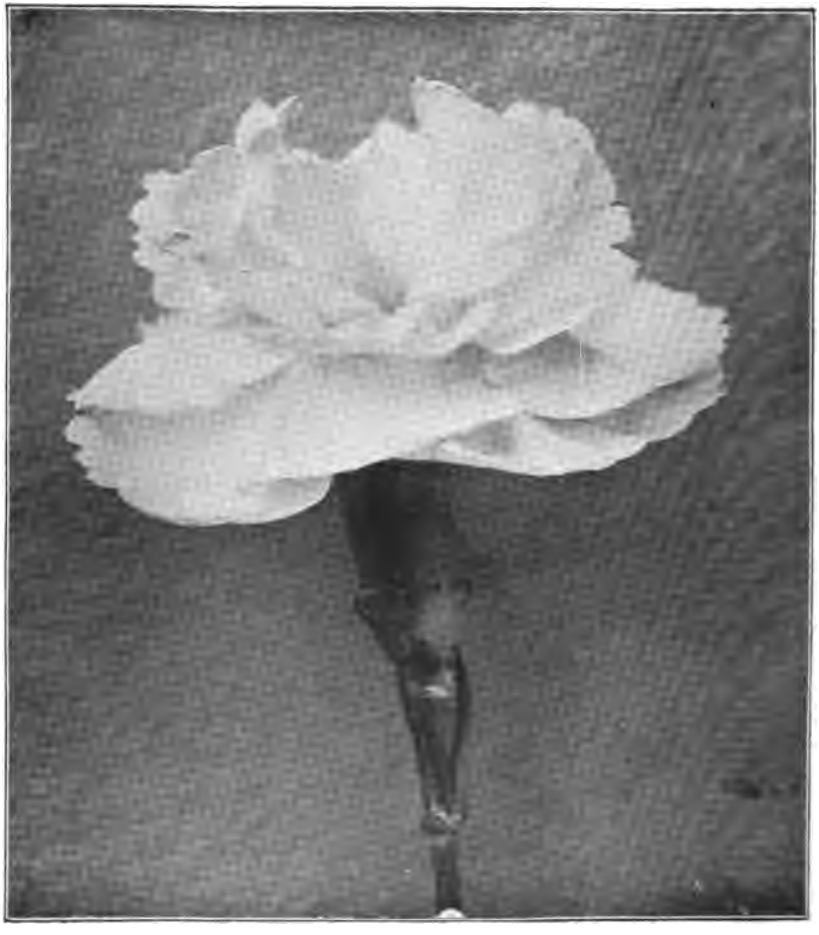

PLATE No. 16.

Ideal White Carnation.

Side View.

the past ten years, we will now pass upon the screen a number of varieties, giving you the name of each variety as it is shown.

The first is William Scott, introduced in 1893, and still largely grown.

The second, Storm King, a beautitul white, introduced in 1895, but now almost obsolete.

The third, Mrs. George M. Bradt, was introduced in 1896; this is the largest and most striking variegated Carnation to date, and and is more generally grown than any other of its class. It, however, has several rivals, among them being Olympia, which you see in the vase upon the table.

The fourth is Bridesmaid, which was introduced in 1897, but which has practically passed out of existence.

In the next run of plates we will show front and calyx views of the blooms, in order to give you an idea of various forms of Carnations. These views are of flowers of comparatively recent origination.

In plates Nos. 15 and 16 we have a snow-white seedling which for beauty of form and purity of color was unsurpassed, but unfortunately it was not sufficiently free in blooming to warrant its commercial introduction. In the front view of the flower the petals are not crowded, but there are sufficient of them to give the effect of a shapely, symmetrical bloom, and in the side view of the flower you will note that the guard petals are broad and stand out flat from the calyx without recurving, while the centre of the flower is well built up and the calyx and stem are proportionately strong.

In Nos. 17 and 18, we have White Cloud, one of the prominent commercial whites of the present time. This is a very full flower, possessing a good calyx, but is rather too full for the ideal flower.

In Nos. 19 and 20 we have a fancy flaked variety, a seedling of 1898. The ground color is yellow and the petals are heavily striped and edged with a pinkish scarlet. You will note that this flower is very symmetrical, that the calyx is perfect, and the guard petals are broad and stand out perpendicularly from the calyx without any tendency to recurve. This flower is exceptionally well formed and may well prove the forerunner of a splendid class of fancy varieties.

In Nos. 21 and 22 we have a huge lemon yellow bloom of the Malmaison type, which produces a flower nearly four inches in diameter. Unfortunately it persists in bursting its calyx under ordinary culture. This bloom you will find in the vase of seedlings.

In plates Nos. 23 and 24 we have another fancy variegated yellow, which shows an excellent form and calyx.

In plates Nos. 27 and 28 we have Governor Roosevelt, a seedling of 1897, which is particularly distinguished by its symmetrical form, large size, splendid calyx, and excellent stem. This variety is probably the most advanced step in the development of the Carnation yet achieved. The flowers reach three and one-half — even four inches in diameter, with stems from two to three feet in length.

In plates Nos. 29 and 30 we have quite a new departure in Carnation seedlings. This is what we may term an Anemone flowered Carnation. You will notice that this flower is composed of a single row of broad guard petals that stand out well from the calyx. Around this is a thick bunchy wreath of fine feathery petals, the same as is seen in the Anemone flowered Chrysanthemums. In the centre of this bloom are six miniature flowers, the largest of the secondary flowers being surrounded by the five smaller. This flower also has four pistils instead of two, and probably if it had been left to develop, some of the secondary flowers might have developed additional pistils. The flower was nearly four inches in diameter and is the most remarkable freak that I have seen among Carnation seedlings, but unfortunately we cannot proceed further in hybridizing with this variety, as it produces neither seeds nor pollen.

Plate No. 31 shows a vase of a seedling which was at first termed No. 666, but is now named Prosperity. This is in some respects the most remarkable Carnation originated to date. The blooms attain a size of from four to four and one-half inches and are borne upon good stems and possess fine calyxes. This is distinctively a fancy Carnation, the ground color being white and the petal being suffused or flaked with crimson pink.

Our next series of views will be for the purpose of illustrating the calyx of the Carnation.

In plate No. 32 we have what is known as a burst calyx. You will note that the flower has grown entirely out of one side of the

PLATE No. 27.

Carnation Gov. Roosevelt.

Front View.

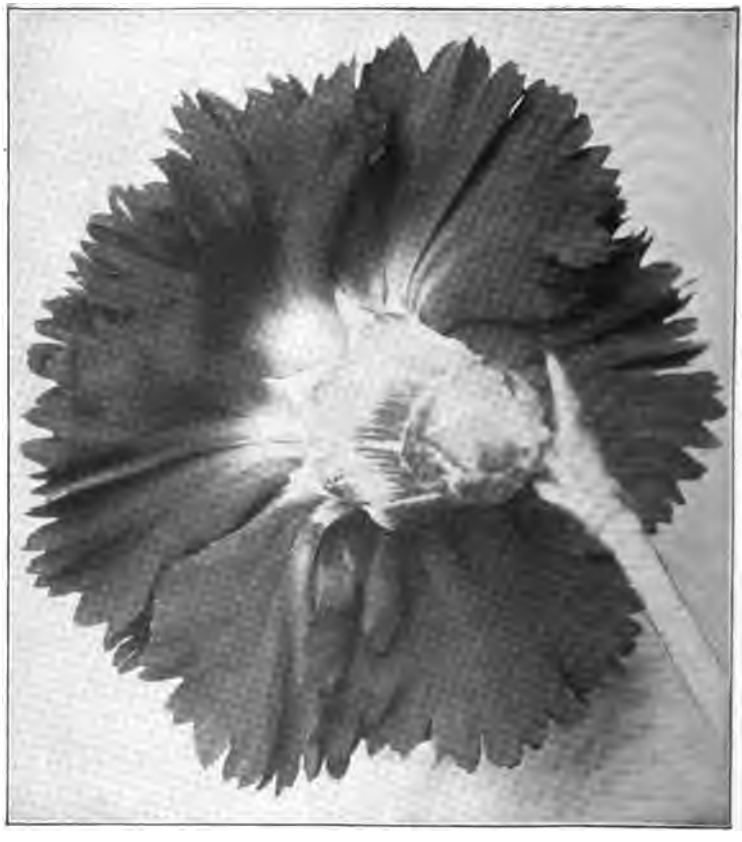

PLATE No. 28.

Carnation Gov. Roosevelt.

Calyx View.

PLATE No. 29.

Anemone Flowered Carnation.

calyx and torn it, so that it is quite out of shape. There is upon the table a vase of burst flowers which will probably give you a better idea than you can get from the picture on the screen.

Plate No. 36 is General Maceo. This has an excellent calyx. A vase of this variety is also upon the table and may be examined at your leisure.

Our next series of views will show interior and exterior views of modern Carnation houses.

Plate No. 40 shows a house of Alaska, a white seedling which we were growing in 1896.

Plate No. 47, a bench of William Scott as grown in 1894.

Plate No. 49, a bench of Governor Roosevelt growing the present season.

Plate No. 52 shows Carnations as they are stored in a cool room preparatory to being shipped to market. This room contained at the time five thousand flowers, this being the day's product cut from ten large houses comprising some thirty thousand feet of glass.

I am asked sometimes why Carnations purchased from the stores frequently keep but a few days, and I am oftentimes requested to give instructions as to how to care for Carnation blooms. In my opinion, the reason for Carnations not keeping after they have passed through the commission houses and stores, arises from the variety of improper treatment which they receive. I have many times seen dealers take Carnations from the box as they arrive and plunge the stems immediately into ice-cold water and set the flowers into a cold ice-box. I think that this alternate chilling and heating of flowers, as by plunging the stems in ice water and chilling the flowers and then placing them in highly heated dry rooms, is the reason for the premature withering away of the Carnation flowers.

You will understand that a flower immediately after being severed from the plant is in a delicate condition. We all know that if we subject our plants in the greenhouses to these sudden changes in temperature, such as chilling them and again overheating them, the plants eventually fade and die. This is especially the case with a member of the plant that has been severed, such as the cut flowers.

The treatment that I would recommend in order to keep Carna-

tions as long as possible, is to plunge the stems in water from which the chill has been taken so that it feels just slightly warm to the hand. Then place the vase of flowers in a room not colder than from forty-five to fifty degrees Fahrenheit and allow the flowers and water to cool down with the room. Treated in this way we keep Carnations from two to three weeks, and in some instances have kept some varieties four and five weeks. If the blooms are kept in a room ranging at from forty to fifty degrees during the nighttime they may be brought into the living room where the temperature is quite high during the daytime, and returned to the cool room each night without serious injury. Treated in this way Carnation blooms should last from seven to twelve days and even longer.

I have found an unoccupied bedroom on the north side of a house in which there is no direct heat, or at least very little heat, the temperature ranging from forty-five to fifty-five degrees, an excellent place in which to keep Carnation blooms. It is in this kind of a room that we are able to keep the Carnations from two to three weeks and even longer, as I have before said.

Our next series of plates will show a few attempts at artistic arrangement of Carnation blooms.

Plate No. 53 is a corner table arrangement in which about three hundred flowers are used.

After listening to this technical description of the advanced improvement in Carnation culture, a few statistics concerning the magnitude of the business, the value of the product sold, the capital invested and the persons employed, may not come amiss. It is impossible at the present time to make correct statements regarding the amount of capital employed, as we have as yet no accurate statistics. From a rough computation I am inclined to think that there are, perhaps, two millions of dollars invested in Carnation growing in the United States today, and that there are probably employed in the production of Carnation flowers, something like five thousand, possibly more, people; these employees receiving wages ranging from $35 to $100 per month, the average wages probably being $45 per month.

It is still more difficult to arrive at the value of the crop produced; but basing our estimate upon the retail prices, the probable value of blooms and plants sold should be from three to four

times the capital invested. There are about two and one-half millions of young Carnation plants and rooted cuttings sold each year, and florists produce an equal amount which they themselves use for growing and which are not sold; so that the entire production of rooted cuttings and young Carnation plants will approximate five millions per annum. Of these plants at least four-fifths are grown under glass during the winter time for cut-flower purposes, some three to four million plants per annum being used for this purpose. Assuming that they produce an annual average of twenty flowers to the plant would give sixty millions of blooms produced upon the American Continent each year.

What becomes of this enormous number of flowers is somewhat of a mystery. They are put to innumerable uses. The Carnation is a flower that awakens the love of almost every person, and as the average Carnation blooms are sold at much more reasonable prices than many other flowers, they come within the reach of a larger class of people than do roses and orchids; consequently the consumption is larger. There is no use to which flowers can be put for which the Carnation is not fitted. It lends itself to almost every scheme of decoration. Its delicious, clean, pungent, aromatic fragrance admits it to almost every sick room; it is unsurpassed for dinner or centre-table decorations; it is universally used in the making up of set pieces; it is also one of the best flowers for boutonnières that the florist has at his command; and finally, its wide range of pleasing colors, its lasting qualities and fresh, rich, clove fragrance combine to make it one of the most popular, as well as one of the most sought for and profitable of florist's flowers.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, March 17, 1900.

A meeting for Lecture and Discussion was holden today at eleven o'clock, Vice-President, BENJAMIN P. WARE, presiding.

The following lecture was delivered:

Japanese Plums.

By George S. Butler, Cromwell, Conn.

About thirty years ago a California gentleman secured several plum trees from Japan through one of our Consuls (Mr. Bridges), at a cost of ten dollars each. These trees passed into the hands of John Kelsey, of Berkeley, California. When they began to produce fruit, in 1876, Mr. Kelsey became convinced of the value of the plum for general commercial cultivation, and it was placed with an Oakland nursery for propagation on a large scale, and named in honor of Mr. Kelsey.

The Kelsey not proving hardy in the North and East, the Japan Plum was condemned as not worthy of trial here, making the introduction of other varieties in this section very slow indeed.

Subsequently other parties, particularly Luther Burbank, of Santa Rosa, California, made other importations of Japanese Plums, and these varieties have been widely disseminated over the United States and Canada, and contrary to the opinions founded on the behavior of the Kelsey, have proved to be adapted to a wide range of territory.

These plums are now classed botanically as *Prunus triflora*, from the fact that usually three flowers come from each bud, but they are easily cross-fertilized with *domestica*, *Chicasa*, *Americana*, and *Simonii*. We are beginning to have many of these crosses which are hard to locate, but as most of us are more interested in producing fruit to tickle the consumer's palate, and touch his pocket book, than in the abstract science of botany, we shall probably not be worried if our professors have to earn their salaries, guessing at where some violent cross ought to settle down and behave itself.

For the past decade, interest in the Japan Plum has steadily and rapidly increased and although many of them are inferior in quality to some of our European or *domestica* varieties, their great beauty, freedom from disease, ability to resist the attack of the curculio, and heavy cropping qualities, have brought them into favor with growers, and some are proving of fair eating quality and superb for canning or preserving.

Nearly all the Japan Plums are vigorous growers with long forked branches, the fruit buds setting in great clusters, instead of singly and in pairs as in the European varieties, and when in bloom we often have all the branches completely hidden.

But these plums are much more nearly allied to our native plums of the Wild Goose type than to the European, and this similarity is a strong point in their favor, for we may reasonably argue that similarity of environment has produced similarity of attributes, and we know that the eastern Asian country is furnishing us many other valuable plants. The North China type of peach, today we are all turning to for our improved varieties and with great and reasonable hope of success.

Doubtless our American plum of the future will be based on the *Americana* species (although today but the child of the forest), crossed with this Japan type, so similar in tree but centuries in advance in fruit, with possibly the admixture of the European for quality and *Simonii* for — some other reason — if any, probably curiosity.

Most of our importations of Japan plums have been introduced under the names of Botan, Sweet Botan, Sumomo, Shiro, Wasse, Botankio, Hattankio, Satsuma, Yone Momo, Nagate, or some combination or corruption of these names. These names refer to classes, not varieties, of plums. For instance, the Sumomos are early round plums like Willard, Ogon, Yosobe, etc., although Professor Tamari, of Tokio, says Sumomo means "Plum" and Wasse means "early." Some of the other words have as many meanings and as diverse as some of our English words, and most of the trees and scions imported seem to have been thoroughly shuffled and then labelled to suit the desires of the purchaser. For instance, we have the Chabot — first imported by Mr. Chabot, of California, and introduced under that name in 1886, by Luther Burbank — under eight other names, four of them Japanese and four American. No doubt this plum is entitled to all the good names placed at its disposal in the past twenty years, but it will require some agreement on the part of nurserymen to get rid of the eight tails to its name, with the possibility of another nurseryman's discovering its good qualities every other year as in the past, and introducing it under a new name to be ferreted out and laid aside in turn.

The Georgeson has been sent out under five different names and all from the same party, while the little Red June, even, rejoices in three.

Thus we see how easy it is to multiply varieties on American soil, but I am glad to say there is a determination on the part of our best nurserymen, our Experiment Stations, and the American Pomological Society to do away, as far as possible, with the confusion of Wasses, Sumomos, etc., and the duplication of varieties.

The culture of this fruit is hardly a subject to occupy much time in a paper of this kind, for it is a matter of almost universal knowledge today that the best crops of any fruit are only secured by constant and thorough tillage with tools best adapted to the land in one's possession. We use the gang plow, extension head cutaway, Acme smoothing harrow and weeder; if the land is very stony the spring-tooth harrow would probably be the only one used.

Set first-class trees. Many orchardists save a few cents on a tree by buying light grade trees. Granting that the trees are first class, but young, the entire saving would not more than pay the interest on the value of an acre of good land, not to mention the cost of a year's cultivation; but if the stock is the same age but inferior in quality, as is usually the case, the weakness is liable to be always manifest. If the tree only develops to a cull in the favorable conditions of the nursery, the chances are that it will die a cull in the orchard.

The first season the tree will make nearly as much growth as the peach under favorable environment, and should be treated in much the same way; thinned, to start the form desired, and headed in sharply during the dormant season. The following season, the roots having a firm hold to start with, the growth will be quite heavy if cultivated, fertilized, and trimmed thoroughly, and this growth should be heroically cut back. The following season the orchard or tree should begin to fruit, and with fruitage the tree growth will be somewhat curtailed, but we find severe pruning advantageous even in our old orchards, saving thinning of fruit by hand and placing the crop where the tree can carry it more easily.

The propensity to overbear must be continually guarded against, as the quality of the plums on an overloaded tree is very inferior,

and having neither quality nor size, it is difficult to get our city friends to part with much of their good money in exchange for them. If two-thirds of the bearing wood is trimmed off from the tree and the plums which set on the remainder are thinned to about four inches apart, we shall have on a mature tree, from one to two bushels of plums, from two to two and a half inches in diameter, and as attractive as they are large. California never shipped to New England as large, handsome, or good quality plums as we have placed upon our markets the past four years. But I have seen the same varieties sent here from Michigan, yes, and grown in Connecticut too, that proclaimed the doctrine of sixteen to one more loudly than William Jennings Bryan or George Fred Williams were ever able to, even when they got their second wind. That is, there were sixteen times as many stones in each basket, sixteen times as much plant food sucked from the soil, sixteen times nearer a drained dead tree, the flesh over the stone a sixteenth of an inch thick, and as interesting to eat as sixteen corks which have never held the mouth of a bottle shut. These plums were bought by sixteen sons of Abraham, who yelled themselves hoarse trying to sell them for sixteen cents a peck. The other plums sold themselves in fancy groceries and fruit stores at $1.25 per peck. There is nothing overdrawn in this comparison, except the Sheeneys' selling price, which I have known to drop to ten cents per peck.

The rot (*Monilia fructigena*) is the most troublesome enemy of the Japan Plum — unless it be its own tendency to overbear — but this disease is no more serious than on the Domestica varieties, if as bad. Eternal vigilance is the price of plums (as well as of anything else worth having), and we have made it our practice to have some trusty men practically live in the orchard after the first of June, going over the trees systematically, thinning out imperfect and superfluous plums, and always having an eye for the rot, which is "carried forth without the camp" — being more contagious than leprosy — and either burned or buried in a deep, deep hole. Beside picking off the mummified plums we shall, this month, apply a strong copper sulphate spray (ten pounds to a barrel of water) and Bordeaux mixture, before the buds open, but shall not experiment very heavily on the trees with any spray after

leaves appear, being perfectly willing to let some one else furnish the bulk of the experience on that line.

From sources of undoubted authority I learn that the disease known as "Yellows" in the peach thrives on the Japan plum, although I have never seen a tree which I felt I could declare a bona fide case of "Yellows;" if I did I should surely treat it as I would the same disease in the peach.

We have lost from one to two per cent of our trees from unknown causes, each season, and after laying it to winterkilling, grubs, and various other causes, have about decided that the disease should be known as "Oriental cussedness," as we notice some of the Japanese ornamentals occasionally dying in the same way without the slightest provocation.

Black knot makes but very little headway on the Japan Plum. We easily cut off all the limbs attacked during the winter pruning and have made no attempt to watch for it, as we have to on some European varieties. I doubt whether one tree in a hundred in our orchards has ever had a knot on it.

The curculio finds more than he can eat, or spoil, and, in fact, although he gets in his work, the scar on the skin is about the only evidence of his labors, as very few of the eggs ever hatch.

Another great enemy of the Japan plum has been the nurseryman who persists in introducing new and wonderful varieties, like the Berckmans, which is little better than none at all, or the Willard, which is hardly as good, or the Kerr, which might as appropriately have been named "Yellow Dog."

Having thus briefly described a few varieties it might be well to enter into the characteristics of the others which are known.

Earliest of All, also known as Yosobe and Wasse Sumomo, is a very early — July 10 to 15 — light red plum with yellow, soft, sour, and bitter flesh, clingstone, not salable in competition with Montmorency cherries.

Berger, also known as Strawberry, Uchi Beni Honsmomo, and Ura Beni, is in size and color about like the Earliest, but the flavor is quite distinct and better; it is a few days later. They drop from the tree when ripe, making picking very easy.

Lutts (Wasse-Botankio) is the best of its season, which is mid-July. If you can imagine a half-grown Burbank ripening a month ahead of time, you have it very closely.

Red June (Red Nagate, Nagate No Botankio) is of medium size, deep red skin, yellow flesh, clingstone, and of fair quality.

Ogon is a yellow plum, no worse than Willard in quality.

Maru ripens at about the same season as Abundance, but cannot compete with it in either size or quality, especially the latter.

Abundance is undoubtedly the best known of any of the Japan plums, and, all things considered, is the best eating plum we have when properly grown and thinned. A large, handsome fruit, rich cherry color when ripe, with a white bloom, highly perfumed, rich and juicy, flesh light yellow. When overripe it loses some of its fine quality. Tree a handsome upright grower and inclined to overbear. If good size and quality are desired it must be thinned vigorously. Season early August.

Burbank is a very large, handsome, and popular variety. Eight of these plums filled a quart mason jar, and we had specimens which would not pass through the opening in the top of such a jar. Our trees of this variety when loaded with ripe fruit presented the handsomest fruit picture it was ever our privilege to look upon. Canned with the skins on they produce a very rich looking liquor, but as the coloring matter is all in the skin, we produce an entirely different article, in color and flavor, by removing the skins before cooking; in fact, except for the clingstone, and the plum taste which lies near it, the pared fruit cooked, can hardly be distinguished from peaches. The tree is a rampant sprawling grower, very distinct and noticeable. Season closely following Abundance.

Hale produces more *wood* in a given time than any other plum we know of. We have also had specimens of the fruit and find them equal in quality to any plum in our orchard; about the size and color of Reine Claude and in season with the last of Burbank, from the middle to the last of August.

Georgeson, also known as White Kelsey, Mikado, Yeddo, and Normand seems to be the largest of the yellow-skinned Japan plums, and superior to all others of its color, except Hale, in quality. Tree a rather better grower than Burbank, but somewhat sprawling. Such fruit sells for about one-half the price of Burbank or Chabot, one of which may be had at the same time, and as it is not much superior in eating quality, I would not advise its propagation.

Wickson was introduced by Mr. Burbank as a Burbank-Kelsey cross, and thus a pure Japanese variety, but it is very evident that he was mistaken, and there can be no doubt from the character of its foliage, bloom, and fruit, its habit of growth, and method of bearing fruit, that it is a hybrid of Kelsey and Simonii. Fruit very large, long heart shaped with a deep suture; color, deep maroon-red, sometimes shaded lighter; pit small; flesh firm and meaty, yellow, rich, and aromatic, with a slight almond flavor; clingstone. The fruit favors Kelsey strongly, except in the color of the skin. Tree a narrow, upright grower, like Simonii. We have had but little fruit as yet, but hope another season with four-year old trees to be able to report good cropping qualities.

Chabot is also known as Bailey, Chase, Yellow Japan, Botankio, Hattankyo, O-Hattankio, Furugiyi, and Orient, and has even been sent out, I understand, for Uchi Beni, which it resembles about as closely as an Angora cat does a rhinoceros. This medium to large plum is, without doubt, all things considered, our most profitable market plum, coming the fore part of September when people begin to be willing to can and preserve plums. This plum will keep for weeks if necessary, and is the marketman's delight, as there is practically no loss. The tree is a strong upright grower, perfectly hardy, and very prolific, with handsome red and orange colored fruit; soft sweet yellow flesh, of good quality; clingstone. We have over two thousand trees of this variety in our orchards now, and shall continue to plant them until something better appears on the scene.

Satsuma (Blood Plum, Yone Momo) gives us very large fruit when properly thinned. Round-oblong with a blunt point and deep suture; color, dull brown-red mottled with greenish dots; flesh hard and blood-red. It seldom becomes edible with us, but for canning or preserving it has no equal. We have yet to learn of a single party who has once had the fruit who did not demand it in succeeding seasons. Our plums of this variety have retailed in the Hartford market for $5.00 per bushel. The tree is a strong grower, rather inclined to upright in form but still somewhat sprawling, and does not seem to come into bearing quite as young as some others.

DISCUSSION.

The lecturer said that carbo-sulphate spray, however weak, is injurious to Japanese plums when in leaf. He recommended the Abundance and Satsuma for private gardens. The Chabot comes at a good time for canning and is excellent for that purpose. The Satsuma and Chabot are very distinct; the former is of a rich red color, while the latter is yellow.

Joseph S. Chase said that Climax had not fruited this side of California. Mr. Burbank says it will revolutionize plum culture. The season of ripening seems to vary; the Hale varies in season. He would include the Burbank in a dozen varieties; it bears very young.

The Chairman said that there is now great competition in all farming operations, and that plum growing is well worthy of attention as a mercantile pursuit.

The lecturer said he had no doubt that the demand for Japanese plums will increase in the market. He thought that the more people have of these things the more they want. Over production occurs sometimes in all businesses, which may be a good thing. He thought we could not fill up Boston market for some time. Three years ago it was hard work to sell a wagon load of plums in Hartford in a day; now he can sell three.

Japanese plums will flourish wherever peaches will, and in a good many places where peaches will not. They are adapted to a much larger range of territory than peaches; they will flourish on a flat plain and on land where water stands. He had used bone and potash, but found no great occasion for potash. The winter of 1898 and 1899 was the severest known for generations, but plums bore full when the peach crop was entirely destroyed. Japanese plums naturally set fruit so heavily that it would be of no advantage to prune in summer for productiveness. He prunes at any time in the winter when it is not too cold. Much of the pruning is thinning out.

Hon. Aaron Low had set out plum trees in the chicken yard for shade. He jars the trees slightly and the curculios fall and the hens take care of them. He sold his plums for one dollar per peck. He advised those who have room in the hen yard to plant Japanese plums; some of the varieties are better than the Euro-

pean, and seem to be very desirable for planting, especially the Abundance and Burbank.

The Chairman thought that Japanese plums are not so subject to the curculio as the European varieties. He uses a padded mallet in destroying them; he strikes the trees, and as the curculios drop off the hens eat them.

A gentleman asked the lecturer whether the late spring frost is detrimental and also about his treatment for the curculio.

The Lecturer said in regard to the spring frost that two years ago when his Burbanks were in flower he had thought his plums ruined by frost, yet when harvest time came he had a good crop. As to the curculio, he had done nothing towards destroying it except incidentally to thinning and he simply picked off the wormy plums when harvesting. He thinks the curculio is not as troublesome to Japanese plums as to European. When the egg is laid on the Japanese plum the skin seems to dry back, leaving a scar, and that is the end of the egg. He thins so that the plums can grow as much as they want to without touching each other.

In answer to a question by Mr. Harrison, Mr. Butler said that he has had Japanese plums since 1889 and has had very little black knot. When pruning his trees he cuts off all black knot and burns it.

Mr. Chase said that he considers the Satsuma the best plum for preserving, and asked the lecturer what he thought of the Wickson for general cultivation. Mr. Butler was not prepared to recommend or reject the Wickson. Its fertility is not tested. It would not be so much work to thin it as to thin the Abundance. The Wickson bears on older wood. The Abundance is all gone before the Wickson comes in. He had been reckless enough to set out six or seven hundred in his orchard.

A gentleman said that he had seen Mr. Butler's plums in full fruiting and had never seen such a sight. He has, himself, a little plantation in Plymouth County, and in Essex County he has 12,500 plum trees, and has been very much encouraged because he has found all the obstacles that he had feared were mere moonshine. He had no winter frost, no spring frost, no black knot, and no curculio. He sold all his fruit at the orchard.

A vote of thanks to the lecturer was unanimously passed.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, March 24, 1900.

A meeting for Lecture and Discussion was holden today at eleven o'clock, Vice-President BENJAMIN P. WARE presiding. The following is an abstract of the lecture delivered. The Committee on Publication and Discussion regret that they are unable to present it in full, as Mr. Hale spoke without notes.

APPLE CULTURE FOR PROFIT.

By J. H. HALE, South Glastonbury, Conn.

The lecturer began by saying that he had received inspiration from the Massachusetts Horticultural Society in the cultivation of fruit, and was glad to come here and make return. For the first hundred or two years in the history of this country apples were cultivated mainly for cider. No bounty was ever offered for cider as there was for wine in Virginia, yet farmers would have forty, fifty, or a hundred barrels of cider. The apple is the most easily cultivated of all fruits, and therefore less pains have been taken with it than would otherwise have been. We have taken them as they come and have not attempted to bring them to perfection, because the apple is so good and kind to us and will give much good fruit even under great neglect.

New England, as regards soil and climate, is better suited to the apple than any other section of the country. We can grow apples of finer color, flavor, and texture, and longer keeping in New England than anywhere else. This was the lesson of the Chicago Exposition. All the different states gathered their choicest apples; there were beautiful apples from Michigan and the Ozark region of Missouri; from Oregon and the Snake river country of Idaho; from Western New York, and other so called favorable apple sections. As the apples melted away they were renewed from day to day from cold storage, but the cold storage house was burnt, and in a few days after that there were no apples except from the northeastern corner of the United States; these held up, many of them, from the middle of July till the middle of August

and into September, when the new crop of the same variety was ready to take their place on the exhibition table.

The first thing beyond soil and climate is to have good trees with perfect foliage from the beginning to the end of the season, but there is no such thing without spraying from two to four times a year. Frequent and thorough tillage of the soil is necessary, but many trees in New England are in sod land. This should be broken up whenever possible and good tillage take its place. In rough, rocky lands or steep hillsides where cultivation is not practicable, top dressing, mulching, harrowing, pasturing with sheep or hogs — some one or more of these should be practiced, according to local conditions. The trees must have room enough for air and sunlight. Like man they need circulation of air all round. The second thing is intelligent feeding; they need potash and phosphoric acid with a moderate amount of nitrogen. Fungous growths will attack even the best cared for trees, to some extent, so that spraying is essential. The fruit must be thinned, for the double purpose of securing fine perfect fruit and annual fruitage.

What can we do with our old orchards? They should be pruned, but for this you want a man of experience and knowledge of old trees. Coming here the lecturer saw men cutting right and left limbs from two to eight inches in diameter. New men go at this work with more zeal than knowledge. Cut out all dead wood and some small branches. Large limbs may be cut two or three feet out at any time when the trees are dormant, and then cut close in the growing time. Don't try to do it all in one year; take two or three years. Most old orchards are in sod, and if they are near the house, where you do not want to break it up, give it a heavy top-dressing of manure and harrow it. But if your orchard is to be devoted to apples only, plough it up—not too deep—and harrow in fertilizers. Scrape off the old rough bark and wash with Bordeaux mixture of double strength while the trees are dormant. Carry on the ordinary summer spraying for the codling moth, etc., and keep the ground broken up as long as you want good apples. If your land is too rocky or rough to plough, it may be mulched with any old material that is available—anything that will kill out the sod—but ploughing is better. Any grass that grows in the orchard should be allowed to die down to form a mulch, and eventually a fertilizer for the land. You may pasture swine or

sheep in your orchard if you wish. The lecturer knew a man who made an orchard of eight acres a pasture for hens—he had a thousand laying hens—and he is fifty per cent better off in yield and quality of apples than the former owner, who made the same orchard a hayfield. After cultivating an old orchard a year or two it will be necessary to thin out the fruit.

But the great hope lies in new orchards, which may be planted on poor land now growing up to bushes. There are thousands of acres of such land in New England, which if planted with late keeping red apples, will pay dividends two to one over railroads, insurance companies, etc.

A new orchard wants to be started on land as thoroughly prepared as for any other crop. Do not think you can grow two crops with only fertilizer enough for one. Some low growing cultivated crop may be grown the first four or five years, if fertilizer and culture enough are given for both. The orchard should be thoroughly cultivated through the growing season, beginning as soon as the buds begin to swell. Prune the trees by pinching in. Go over the trees three or four times during the summer, and pinch in every shoot that grows where you do not want it. If headed low, spraying and all other operations can be more easily performed.

The question of varieties is a local one, and yet it is not, for apples can be shipped to any part of the world, though there may be a local and special market for some varieties. Color catches the eye, but get as much flavor and high quality with it as you can.

In regard to distance, forty feet is near enough for some varieties, but the lecturer recommended setting twenty feet apart, and when the trees grow to touch each other, cutting out three-quarters. You will be tempted to leave them, but a business man should have courage to cut them at the proper time and not delay a single year after they begin to crowd. In this way three times as much fruit can be had in the first twenty years of the life of the orchard and after that the orchard will be just as strong as though originally planted forty feet apart.

The matter of feeding depends greatly on soils. The lecturer thought that there is a great deal of food locked up in Massachusetts soils; enough of potash and phosphoric acid could be made free and brought out by frequent and thorough tillage; the nitrogen you can get by ploughing in leguminous crops. The successful

horticulturist is the man who stirs the soil. Stirring the soil produces chemical action. Ploughing and harrowing are too hurried. Gen. John Bidwell, of California, had forty thousand acres of land which he ploughed hurriedly with gang plows and harrowed with a twenty-two feet sweep and got fifteen bushels of wheat per acre. A lady near by ploughed with modern steel plows and a pair of mules and harrowed two or three times with cutaway harrows, and got thirty-five bushels to the acre. Neither used any fertilizer. The man who is producing plants which grow quickly must have two or three times as much food in the soil as they need, so that it may be easily reached. Trees do not require their food so quickly available.

You cannot have good fruit without thinning. When young trees attempt to bear ten apples pick off eight and leave only two to come to perfection, and you will have two fine specimens. The next year pick off fifteen out of twenty; the third year pick off seventy-five out of a hundred. The talk of an "off year" is nonsense; trees can be educated into the habit of bearing every year. When the climatic conditions are such that the crop is killed, the next year the tree will be so full that it cannot ripen the fruit and at the same time form buds for the next year. By thinning out from seventy-five to eighty per cent every year you can bring the tree into the habit of annual bearing. If the tree is trained low you can thin the fruit much more easily. You must do it for fine fruit and greatest profit.

After the orchard is established comes the question of the time of picking. Watch the apples closely, and as soon as they come to maturity pick them, however early, even if it be August or September, and put them into cold storage. Place them at once in the packages they are to be sold in, but they should be graded —some will want two grades and some three—and packed honestly from top to bottom. As to packages the barrel is an abomination; in the first place it holds too much fruit and it is liable to heat inside. It can be rolled, and the effect on its contents may be like that of the founder's tumbling barrel on his castings. We want the largest package that we can tempt the consumer to buy. The lecturer recommended neat and attractive boxes, to hold a bushel each; a box twenty-two inches long, eleven and a half wide, and ten deep holds just a bushel. He showed

apples from such boxes which sold for two dollars per box by the car load, and Baldwins from a Massachusetts barrel, one from the top and a smaller one from eight inches down, which brought but two dollars per barrel. The man who raised them probably does not believe in spraying or thinning.

Three-quarters of all the apples in Boston Market are the abominable but good looking Ben Davis. The great market apple of America will open the pocket book, but you must have quality to keep it open. The Mann is a new, yellow, long-keeping, delicious variety. The Sutton Beauty has never been thoroughly appreciated; it is delicious. It is a red, long keeping apple, better every way than the Baldwin. The Gano is grown largely in the West; it produces a large proportion of perfect specimens quite a little better than Ben Davis; eighty or ninety per cent are equally good. Cooper's Market is grown largely in Pennsylvania. Damaged products sell for what people will give; this is the business rule the world over. We have been producing eighty-five per cent of damaged apples when we might have produced ninety-five per cent of perfect ones. Old methods of neglect cannot make apple culture profitable but under the best methods of culture, pruning, spraying, and thinning, it could be made the most profitable branch of agriculture.

Discussion.

The Chairman said that Mr. Hale had evidently been studying human nature as well as apple culture. He had planted apple trees twenty feet apart, intending to thin them, but they grew to be such beautiful trees that he had not the courage to cut them out.

He said that the lecturer was ready to reply to any questions that might be asked, and invited the audience to ask him the hardest questions they could.

Robert Manning said that he would ask the lecturer the hardest question he knew of connected with apple growing, and that was how to prevent injury to the fruit by the apple maggot or railroad worm (*Trypeta pomonella*), which is much worse than the codling moth, boring the fruit through and through till it is honeycombed.

Mr. Hale replied that nobody now knows how to destroy the apple maggot, but we may next year. It is the one thing connected

with apple culture that we do not know how to handle. The only thing to be done at present is to feed the infested apples to stock.

In answer to an inquiry how to shape trees, the lecturer said that he could not lay down a rule for all varieties, but would pinch constantly, having a central stem with a branch every foot if possible.

The success of cold storage depends largely on the temperature. Commercial cold storage is too cold; if kept down to freezing the apples lose flavor; from thirty-eight to forty-two degrees is cold enough. In a good cool dry cellar apples can be kept till spring. In large operations a tunnel like a wine vault in a side hill might be made valuable for storage.

In answer to a question as to the cost of caring for an orchard the first five years, the lecturer said that it depended largely on the character of the land chosen; he had spent more money clearing up walls, etc., than the land cost—$15 or more per acre. He thought a fair estimate of the annual cost of an orchard of one hundred acres would be about $15 an acre annually, but it would vary according to the land. He has an orchard of twenty-five acres which cost less, but it is easy soil. Light sandy soil is easy to work, but it is not the best; it gives the highest colored but not the longest keeping fruit. Strong loam with clay is the ideal soil for apples. An acre of good apple trees in fruiting is worth $2,000, and will pay good dividends. Land near a railroad, reached by a good road, might be cheap at $100 per acre, when land four or five miles away over a bad road might be dear at $5.

In answer to an inquiry about draining, the lecturer said that apple trees do not like to have their feet wet. Some land needs drainage and some does not; more needs it than we think.

Borers should be dug out two or three times a year—in September or October after they are hatched, and then again in May to get what escaped you. To prevent the borers from laying their eggs around the collar of the trees, place a mound of earth around them the last of April and do not take it away until the first of August.

Most apples are self-pollenizing and will fruit alone, but you will have better fruitage with more than one variety of apples in an orchard.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, March 31, 1900.

A meeting for Lecture and Discussion was holden today at eleven o'clock, Vice-President BENJAMIN P. WARE presiding.

The following lecture was delivered:

FUNGUS DISEASES COMMON TO CUCUMBERS, TOMATOES, AND LETTUCE UNDER GLASS.

By Professor GEORGE E. STONE, Amherst, Mass.

In considering this subject it should be stated that any single one of the three plants mentioned would furnish matter enough to occupy one's attention for more than an hour; indeed the consideration of either one of them would fill a large volume. We shall, however, briefly consider the fungus diseases common to these three crops, as well as touch upon some of the methods of cultivation. Diseases of plants have been known from the dawn of civilization. Rusts, smuts, mildews, and rots are old terms, which are mentioned in the most ancient writings. Before, however, we commence to consider the fungus diseases of these crops, let us fully understand what we mean by disease, and also some of the conditions which are favorable in the plant organization for the intrusion of fungi. We can define a disease as a failure or perversion of the normal physiological activities of the living organism. Diseases may arise from intrusion of parasites or they may be due to purely physiological disorders. In both instances conditions result which may be manifested in stunted growth, abnormally enlarged part, or disintegration of the tissues, which frequently result in the death of the organism. There is a disposition of plants as well as animals to disease, which may be an internal or inherited one, as we see in some variegated plants and in run-out stock, or an external or accidental disposition dependent upon environmental factors. It is also known that there are other conditions upon which disease depends; for example, a plant at the lower limit of vital activity is more susceptible, and also young tissues are more susceptible than old tissues to disease, as illus-

trated by "damping off" of young seedlings. Also, when a plant is in a state of inactivity it is more susceptible. The diseases which we are to consider at the present time are those to which greenhouse plants are subject, and which, to a certain extent, differ from those out of doors.

In growing greenhouse crops the gardener has the environments under his own control, and the more thoroughly he understands the proper conditions of the plants the less likely they are to be diseased. While the control of the plant's environment is desirable in many ways to the gardener, it also has its drawbacks, for if the gardener does not understand the plant's requirements diseases are sure quickly to show themselves much more disastrously than when out of doors, and left to nature's care. The principal factors which the gardener has to deal with are heat, light, moisture, and soil, including its chemical composition and physical properties, the latter being of as much importance as its chemical composition, inasmuch as the first requisite of normal plant development is proper environmental conditions.

We shall take up first the subject of cucumbers. These are extensively grown in our State and require a temperature from sixty-five to eighty-five degrees Fahrenheit. They are not especially sensitive to mechanical conditions of the soil, neither do they respond very quickly to fertilizer. A good soil for cucumbers is one made of decomposed sod and horse manure. This makes a light, friable soil. They require all the light possible under glass, especially between the months of November and March, a matter which is too little understood by those growing cucumbers. Some of the so-called diseases can be traced directly to the lack of light in the house. This is especially true where growers have resorted to the practice of using two layers of glass in their houses. The plants, under such conditions, cannot assimilate the carbon dioxide from the air properly, as the light is largely excluded by the two layers of glass and the usual two accompanying layers of dirt. As a result of this ignorant practice the loss in carbon assimilation and growth, according to my observation in certain cucumber houses in Massachusetts, is as high as seventy or eighty per cent. Under these conditions they behave like plants grown in the dark; that is to say, they are etiolated, their stems become weak and slender, they develop thin yellowish green leaves devoid of good

texture, and they are rendered more susceptible to disease. When raised under these conditions and exposed to the bright sun of spring they wilt badly and the foliage becomes quite useless to the plant, as a result of which the vines are poor, and owing to the lack of assimilation due to the paucity of green foliage the cucumbers grow stubby and bring a low price.

There are ten fungus diseases peculiar to the cucumber, which have received more or less attention. Some of these are of rare occurrence and only show themselves when something is radically wrong with the methods of cultivation of the crop. There are others, however, that are more or less universal and require consideration. Among these may be mentioned the damping fungus which attacks seedlings, the powdery mildew, stem rot, timber rot, anthracnose, and bacterial wilt. The last is peculiar to outdoor cucumbers in Massachusetts. It is caused by bacteria which plug up the vessels, thus interfering with the water supply. The disease, however, has received special attention by our government pathologists. The powdery mildew is more or less common and can be controlled by attention to moisture conditions and light. It is seldom found on vigorous plants of good texture, such as are grown under normal conditions. The damping fungus is troublesome to young cucumbers and can be prevented by sterilizing the soil in which the seeds are sown. Small quantities of soil can be easily steamed to a temperature of one hundred and eighty degrees F. or more, and if the plants are partially matured in steamed soil before transplanting little difficulty need be experienced with this fungus. This method is now used by some practical cucumber growers in Massachusetts. The anthracnose which attacks the leaves would seem to be caused by too great a difference between the day and night temperature. On this account it is far more common in the spring in greenhouses when the fires go out.

Besides these fungus diseases there are two or three troublesome pests which belong to the animal kingdom, known as aphis and thrip, which are injurious to the foliage, and nematodes, which give rise to galls on the roots. Aphis and thrip can be controlled by the use of tobacco in one form or another, while the only thing that will remove nematodes from a house is freezing, desiccation, or sterilization of the soil. In order to freeze

the soil it would probably, in most instances, have to be removed from the house, but the desiccation can be most easily and cheaply done during the summer months when the house is very likely to remain unused. To accomplish this the house should be closed up tightly and the soil should be forked over a few times and allowed to dry out as completely as possible. The temperature on hot days will under these conditions go as high as one hundred and forty or one hundred and fifty degrees F. in the house. Sterilizing the soil is more troublesome than the desiccation method, but when done properly is superior to either of the preceding methods. This is accomplished by passing steam through two-inch tile buried in the soil at from eight to twelve inches deep and about twelve inches apart. A large high-pressure boiler will heat a considerable quantity of soil to one hundred and eighty degrees F. in a short time.

Tomatoes require similar temperature and moisture conditions to those of the cucumber. They respond, however, more readily to fertilizers and, like the cucumbers, they should be pruned to get the best results. There are some twelve fungus diseases recorded for tomatoes, but the fruit rot and mildew are the most troublesome diseases in greenhouses. These can be controlled by spraying. They also, like the cucumbers, are subject to nematodes and the same method of treatment applies to both.

The lettuce is the most difficult of the three plants enumerated to grow under glass, and no finer examples of skill in lettuce growing can be seen anywhere in the world than in the neighborhood of Boston. The coast soil, in the first place, is especially adapted to lettuce growing, whereas that in the interior of Massachusetts is not so well adapted, on account of containing a larger per cent of fine sand, silt, and clay and a less amount of coarse material.

There is no plant which we have to deal with that is more susceptible than lettuce to changes in the physical properties of the soil. On this account the cultivation of the so-called head lettuce is confined almost entirely to the Atlantic coast soils where the percentage of coarse constituents is much higher than in the inland soils. In the West the headless varieties of lettuce are grown almost entirely Young lettuce plants (prickers) are more susceptible to soil conditions than those half matured, and when

prickers are placed in a soil where the fine constituents far exceed the coarse material their development is arrested, a feature which is brought about by abnormal root respiration. A typical heading lettuce soil should possess a water-retaining capacity equal to about thirty-five or forty-five per cent, while a soil possessing a water-retaining capacity of seventy per cent is not adapted to lettuce.

There are several fungus diseases listed for the lettuce. Among the more important ones are the mildew, top burn, the drop, and the rhizoctonia. At the Hatch Experiment Station, Amherst, especial attention has been paid to the diseases of lettuce, and, as in most instances where the pathological conditions of a plant has been given thorough attention, and where we have generally supposed there is a certain abnormal condition brought about by a single disease, we have found a number of distinct ones which frequently require distinct methods of treatment. The most troublesome disease, however, is what is known as the drop. This is caused by a fungus (*Sclerotinia Libertiana*, Fckl.) which propagates by a mycelium that ramifies through the soil, and also by small hard black masses known as sclerotia which develop from the mycelium. This disease frequently causes great losses in our State. Some houses almost entirely succumb to it, whereas many other growers have from twenty-five to fifty per cent of diseased plants in their houses. It has been found that the best method of treating this disease, and we may add the only one, is by the use of heat or sterilization of the soil. The sterilizing method has already been tried in various forms by many of our largest and most proficient growers. Numerous experiments with gas and chemicals have shown but the slightest efficiency in controlling this. Partial sterilization methods are being tried to control this disease, one of which consists in covering the soil with a layer of about one inch of sterilized soil. This succeeds in greatly reducing the loss. Two inches of sterilized soil is far superior to one, but the steaming of the whole mass of soil is much cheaper in the end. The growth of plants in such soil is greatly accelerated by the effect of the heat on the humus compounds. When this disease, moreover, is once eradicated, care being taken to prevent the inoculation from refuse heaps, there appears to be no reason why it cannot be kept out of

the house indefinitely. The same method of treatment would appear to apply to some of the other fungus diseases, such as the rhizoctonia, which appears to propagate by a mycelium.

A disease known as the top burn, which is characterized by the tops of the young leaves blackening, is well known to lettuce growers. This is caused by no organism, although bacteria sometimes occur in connection with the blackened tissues as secondary intrusions. The disease is the result of functional disorders due to the peculiarities of the greenhouse environment. If a sharp knife is plunged into the soil and passed around close to the plant so as to cut off the ends of the roots, we can produce the characteristic symptoms of top burn. This simple experiment shows us that top burn is connected incidentally, at least, with root absorption, but there are other factors which bear upon the disease. It is most commonly brought about in the following manner: If the night and day temperatures are run high during a period of cloudy weather and this is followed by bright sunshine top burn is quite sure to follow. The reason of this is that high temperature accompanied with cloudy weather causes active growth which produces tissue of an extremely delicate character. When exposed to intense sunlight and rapid transpiration, the edges of the young leaves wilt, collapse, and turn black. The remedy for this disorder consists, therefore, in paying strict attention to the night and day temperatures, especially during successive days of cloudy weather. The control of this latter disorder is indeed a good test of one's proficiency in growing lettuce.

This lecture was illustrated by diagrams and photographs showing the characteristic diseases of Cucumbers, Lettuce, and Tomatoes.

Discussion.

Varnum Frost asked whether the age of cucumber seed contributes towards the crop. Farmers want it from three to ten years old.

Professor Stone said that the subject had never been investigated. The best crop he had ever grown was from seed one year old. In a good house cucumber seed will germinate in five or six days, and the plants will bear fruit six weeks or two months later. The amount of light will have a good deal to do with it.

Thomas Harrison asked whether it is necessary to keep insects in a cucumber house to fertilize the plants. Professor Stone said it is not necessary with some varieties, but it is quite important to have them with the varieties we grow. One would be likely to have a small crop without them.

In answer to a question of Varnum Frost as to how long cucumbers could be grown in the same soil, Professor Stone said he thought forever, if it is renovated with manure.

Professor Stone added that cultivators do not realize that ninety-five per cent of the food of plants comes from the air. Starch is formed by the action of light on the green chlorophyll cells of the leaf. If an opaque object, such as a piece of cork, is placed upon both sides of a leaf and held securely the starch already formed there disappears and no new starch is formed. The same thing takes place when light is obscured in a house; even the shadows cast by the cumbersome framework decrease starch formation. Cucumber leaves arrange themselves as far as possible so that none shall be debarred from the light.

He recommended a single layer of good glass in building a house in preference to double glass. In all probability the large house is cheaper in proportion than a small house.

Some diseases are the result of irrational treatment. Others occur to apparently healthy plants and are caused by genuine parasites which will show themselves if the germs are present. Anthracnose usually comes in spring when the fires are discontinued.

About forty kinds of bacterial blight are known. That of cucumbers is seen out doors but not in the house. It gains entrance to the vessels of the plant and the plant wilts because the vessels are clogged up.

Mildew is a white fungous growth occurring on the surface of the leaves, and the best way to prevent it is to cultivate the plants so that they shall be strong and healthy, as they are then less likely to be attacked.

Another wilt disease of the cucumber is caused by insufficient light, which develops weak plants. The growth of potato stems in the cellar is a familiar illustration of this. Cucumbers when subject to these conditions and exposed to bright sunshine wilt down, but revive when night comes and the next day wilt again.

Professor Stone mentioned three insect pests; the first, the aphis, can be controlled by tobacco. The thrip is very small but very destructive; it can be controlled by the use of nicotine extract or fir-tree oil. The nicotine should be mixed with water and allowed to drip on hot iron. One or two treatments have cleared houses of this pest. Nematodes or eel worms produce galls on roots; they are allied to earth worms but more nearly to the worms found in paste or vinegar. They injure cucumbers, violets, and many florists' plants, but can be destroyed by sterilizing the soil. This, however, will not kill all bacteria. An effectual method of ridding the soil of nematodes is to close the house in July and August, when the heat of the sun will raise the temperature to a hundred and forty or fifty degrees Fahrenheit. The soil should be dug over two or three times so as to expose all parts to the heat. There is no danger of contamination if refuse vegetable matter is not brought into the house again. A house which he sterilized has not been troubled for three years.

Tomatoes thrive under similar conditions to those adapted for cucumbers. They respond very quickly to fertilizers; in this respect they are unlike cucumbers, but they will thrive with less light. They are injured by black rot, caused by a fungus of which there is very likely more than one species. Nematodes also trouble tomatoes.

Varnum Frost thought that the black rot in tomatoes is caused by lack of moisture. Some varieties are free from it, but all Livingston's varieties are subject to it.

The lecturer said that black rot in tomatoes may be cured by the Bordeaux mixture — four pounds of sulphate of copper and four pounds of lime to from twenty-five to fifty gallons of water. By irrational treatment we may get a large number of abnormal diseases in plants. Excess of moisture causes rupture of the tissues of the leaves (œdema); this is a purely physiological effect which never occurs outdoors; it is due to trying to force plants too rapidly.

The lecturer spoke of the remarkable skill of the lettuce growers about Boston; they have learned the most intricate secrets of the business. No plant is so sensitive to soil conditions as lettuce; it is more important than plant food. He had made mechanical analyses of soils and found that that at Arlington will

roll off the hand; it is the best soil in the United States for lettuce. In the west they have to grow other kinds than head lettuce because the soil is not suited to that. Lettuce responds quickly to fertilizers; it must also have a good deal of organic matter in the soil, and it requires a great amount of light.

Fungus diseases have been especially studied. Amateurs get the whole category of diseases. There is no need to worry about downy mildew; there is no need to have it if the plants are properly treated. It appears to be destroyed by summer heat. There are spores which can no doubt stand it, such as the winter spores, but these are not produced in our house.

Top burn is a physiological disease brought about by inattention to the relationship existing between temperature and light conditions; as a result tender tissues are produced. The tender tissues do not get sufficient water from the soil, to meet excessive evaporation and consequently wilt.

In rhizoctonia the fungus eats the blade of the lower leaves and leaves the petiole and midrib. The drop is the name of one of the most disastrous diseases that lettuce growers have to contend with; in one night the whole plant will go down flat. Some growers at Arlington lost whole houses last year. Many methods have been tried, but it can be controlled by one method and only one — by heating the soil. One inch of soil sterilized by heating helps very much, but it must be repeated after each crop. If pipes are put in so as to heat the soil to one hundred and eighty degrees it drives out this disease once for all. Messrs. Hittinger's method is to turn on water from the hot-water pipes, which heats the soil up to about two hundred degrees F. This gives good results. Lettuce is rarely troubled with nematode worms.

The Chairman thought that farmers are not generally aware that so large a portion of the food of plants is drawn from the air.

The lecturer said that in a stick of wood only two per cent is ashes; all the rest is drawn from the air.

Mr. Harrison said that this being the last in the course of lectures for the season he felt it a duty to say that he had received a great deal of pleasure and information at these meetings and it appeared to him from the more than usual number of persons present that there has been great interest in these gatherings.

The topics have been useful and varied, relating to horticulture and other kindred subjects both indoors and out; they have carried us through the fields and forests; along the highways and byways; among the cultivated and wild flowers, and a great variety of trees and shrubs, natives of a great range and variety of climate; they have included many of our useful fruits and vegetables; their illustrations have carried us through all the seasons of the year — spring, summer, autumn, and winter. We must not forget those who have spent so much time and labor in bringing together such an array of talent for our use and instruction, and for benefits received we cannot do less towards our Committee on Lectures and Publication than return to them a most hearty and sincere vote of thanks.

Mr. Harrison's motion was unanimously carried.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1900.

PART II.

BOSTON:
PRINTED FOR THE SOCIETY.
1901.

CONTENTS.

PAGE

BUSINESS MEETING, April 7, 1900; Report concerning exhibition of Boston Co-operative Flower Growers' Association, p. 129; Deficiency in appropriation for Committee on Plants, 129, 130; Property of Society in Lectures, 130; Five Immediate, two Honorary and two Corresponding Members elected 130

BUSINESS MEETING, May 5; Decease of J. D. W. French, p. 130; Two members elected 131

BUSINESS MEETING (SPECIAL), May 26; Vote approving plans and making additional appropriation 132, 133

BUSINESS MEETING, June 2; Memorial of J. D. W. French, pp. 133-135; President authorized to execute deed, 135; Acknowledgements from Honorary Members, 135; Five Members elected 135

BUSINESS MEETING, July 7, Secretary *pro tem* appointed, p. 136; Additional appropriations for Committee on School Gardens, etc., and Building Committee, p. 136; Three members elected 136

BUSINESS MEETING, August 4; President *pro tem* chosen, p. 136; Committees on Revision of Constitution, etc., on School Gardens, etc., and on Nominations appointed, 137; Decease of C. H. B. Breck announced 137

BUSINESS MEETING, Sept. 1; Memorial of C. H. B. Breck, p. 138; Bequest from Benjamin H. Pierce, 139; Nominations reported 139

BUSINESS MEETING, Oct. 6; Annual Election, pp. 139, 140; Four Immediate, two Honorary, and two Corresponding Members elected . . . 139, 140

BUSINESS MEETING, Nov. 3; Appropriations for 1901, pp. 140, 141; President added to Building Committee, 141; Exhibition at opening of New Hall, 141; Bequest of John S. Farlow, 141; Resignation of H. H. Hunnewell, 141, Ex-President retained as Chairman of Building Committee, 142; Three Members elected 145

BUSINESS MEETING, Dec. 1; Resignation of H. H. Hunnewell, pp. 142, 143, Chairman of Finance Committee chosen 143, Vacancy in Executive Committee filled, 143; Schedule of Prizes for 1901 presented, 143; Reports of Committees on Plants, Flowers, Fruits, Vegetables, Gardens, Arrangements, and Library, and Delegate to Board of Agriculture presented, 144; Appropriation for Committee on Lectures, etc., 144; Special Exhibition at opening of New Hall, 144; Letter from Sir Trevor Lawrence, 145; other acceptances and thanks received, 145; Decease of William Saunders announced, 145; Three Members elected . . . 145

REPORT OF COMMITTEE ON PLANTS; Introduction, pp. 147, 148; Orchids shown, 148-150; Spring Exhibition, 150, 151; May Exhibition, 151; Rhododendron Show, 151; Annual Exhibition, 151, 152; Chrysanthemum Show, 152, 153; Drawings of Orchids from Oakes Ames, 153, Financial Statement, 153; Prizes and Gratuities awarded 154-166

REPORT OF COMMITTEE ON FLOWERS; Introduction, p. 167; Spring Exhibition, 167; May Exhibition, 167, 168; Rhododendron Show, 168; Pæony Exhibition, 168; Rose and Strawberry Show, 168; Weekly Exhibitions, 167, 168, 169, 170; Annual Exhibition, 170; Chrysanthemum Show, 170; Financial Statement, 170; Prizes and Gratuities awarded 171–190

REPORT OF COMMITTEE ON FRUITS, pp. 191, 192; Prizes and Gratuities awarded 193–214

REPORT OF THE COMMITTEE ON VEGETABLES, p. 215; Prizes and Gratuities awarded 216–235

REPORT OF THE COMMITTEE ON GARDENS; Introduction, p. 236; G.D. Moore's Lettuce House, 236; Dr. J. Fisher's Tomato House, 237, 238; W. Proctor's Cucumber House, 239, 240; M. A. Patten's Carnation House 240; C. H. Tenney's Estate, 240; Mrs. David Nevins's Estate, 241; W. H. Heustis's Strawberry Garden, 241; O. B. Hadwen's Estate, 241, 242; E. S. Converse's Vinery, 242; A. F. Estabrook's Grounds, 242; The Oliver Ames Estate, 242, 243; Lothrop & Higgins's Dahlia Garden, 243; Col. F. Mason's Vegetable Garden, 243; Col. C. Pfaff's Chrysanthemum House, 243-244; Mrs. A. W. Spencer's Chrysanthemum House, 244; Mrs. B. P. Cheney's Chrysanthemum House, 244, 245, E. Hatch's Estate, 245, 246; E. M. Wood & Co's Rose House, 246; Prizes awarded 246, 247

REPORT OF COMMITTEE ON SCHOOL GARDENS, ETC., pp. 248–254; Medford School Garden, 255, 256; School Garden at Bath, Maine, 256; Louisville, Ky., School Garden, 256, 257; School Gardens elsewhere, 257, 258; Children's Herbariums, 258, 259; Prizes and Gratuities awarded . . . 259–261

REPORT OF COMMITTEE ON NATIVE PLANTS, pp. 262, 263; Prizes and Gratuities awarded 264–266

REPORT OF COMMITTEE ON FORESTRY AND ROADSIDE IMPROVEMENT . . 267, 268

REPORT OF COMMITTEE OF ARRANGEMENTS 269, 270

REPORT OF DELEGATE TO THE STATE BOARD OF AGRICULTURE . . . 271

REPORT TO THE STATE BOARD OF AGRICULTURE 272, 273

REPORT OF THE COMMITTEE ON LECTURES AND PUBLICATION 274, 275

REPORT OF THE COMMITTEE ON THE LIBRARY 276

REPORT OF THE SECRETARY AND LIBRARIAN 277–280

REPORT OF THE TREASURER AND FINANCE COMMITTEE, pp. 281–286; Report of Examiner 283, 284

MOUNT AUBURN CEMETERY 287, 288

OFFICERS AND STANDING COMMITTEES 289–221

MEMBERS OF THE SOCIETY; Life, pp. 292–300; Annual, 301–303; Honorary, 305; Corresponding 306–308

EXTRACT FROM THE CONSTITUTION AND BY-LAWS 304

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, April 7, 1900.

A duly notified stated meeting of the Society was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

Ex-President William C. Strong, Chairman of the Committee appointed at the last meeting to confer with the Boston Co-operative Flower Growers' Association in regard to holding their exhibition of carnations in Horticultural Hall, reported that the Committee were very cordially received by the Association, and that the latter were very desirous to act in concert with the Horticultural Society, but that no arrangement could be made at present, as the exhibition does not occur again until February next, and the present officers were elected only for the present year.

The report was accepted and it was voted that the Committee be continued and that they endeavor to make the desired arrangements for the next year.

The President, as Chairman of the Executive Committee, made the following report for that Committee:

At the regular meeting of the Executive Committee, on the 31st of March, a letter was received from the Chairman of the Committee on Plants stating that his Committee had made awards the past year to an amount exceeding the appropriation by $75. He gave as an explanation of this, that he assumed office after the beginning of the year, upon the death of his predecessor, and the duties of the office were new to him. Considering the circumstances the Executive Committee recommends to the Society an additional appropriation of $75 to cover the awards of the Committee on Plants for the year 1899. In making this exception

to our rules the Executive Committee wishes to emphasize the imperative necessity that the various Committees of the Society should keep within the limits of their appropriations. These are on a liberal scale, and considering the present condition of our finances it is important that there be no deviation from the rule.

The report was accepted and the appropriation was voted.

A question in regard to the property of the Society in the lectures delivered before it was referred to the Committee on Lectures and Publication with full power.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

SAMUEL H. COLTON, of Worcester.
PETER MURRAY, of Fairhaven.
MRS. HENRIETTA PAGE, of Boston.
BAYARD THAYER, of Boston and Lancaster.
MRS. BAYARD THAYER, of Boston and Lancaster.

On recommendation of the Executive Committee

CLARENCE H. CLARK, Ex-President of the Pennsylvania Horticultural Society, Philadelphia, and
ALBERT VIGER, President of the National Society of Horticulture of France, Paris,

were elected Honorary Members of the Society, and

COL. GUSTAVUS B. BRACKETT, Pomologist to the United States Department of Agriculture, Washington, D. C., and
PROFESSOR CARL HANSEN, of the Royal College of Agriculture, Copenhagen, Denmark,

were elected Corresponding Members.

Adjourned to Saturday, May 5.

BUSINESS MEETING.

SATURDAY, May 5, 1900.

An adjourned meeting of the Society was holden today at eleven o'clock, the President in the chair.

The President announced the decease, on the second instant, of John Davis Williams French. The President, with Charles W.

Jenks and Benjamin M. Watson, were appointed a Committee to prepare a memorial of Mr. French.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

IRVING B. FROST, of Belmont.
ELISHA N. PIERCE, of Waltham.

Adjourned to Saturday, June 2.

BUSINESS MEETING.

SATURDAY, May 26, 1900.

A special meeting of the Massachusetts Horticultural Society was holden today at ten o'clock, in accordance with a request from twelve members.

In compliance with this request, agreeably to Sections VIII and XII of the Constitution and By-Laws, the following notice was sent to every member of the Society:

MASSACHUSETTS HORTICULTURAL SOCIETY.

BOSTON, May 19, 1900.

Pursuant to the Provisions of the Constitution and By-Laws of this Society, at the request of twelve members, I hereby call a special meeting of the Society, to be held at Horticultural Hall, 101 Tremont Street, Boston, on Saturday, the twenty-sixth day of May, 1900, at ten o'clock in the morning, to listen to a report of the Building Committee appointed under a vote of the Society, passed at its meeting on April 22d, 1899; and to see whether the Society will approve and adopt the plans presented by the said Building Committee, and will appropriate the sum of $60,000, in addition to the sum heretofore appropriated, for the erection of a building by said Building Committee in accordance with said plans.

FRANCIS H. APPLETON, *President.*

ROBERT MANNING, *Secretary.*

At this meeting the President was in the chair. The call for the meeting was read by the Secretary.

Augustus P. Loring moved the following votes:

Voted: To approve and adopt the plans for a new building presented by the Building Committee at this meeting.

Voted: To appropriate the sum of Sixty Thousand Dollars in addition to the sum heretofore appropriated for the erection of a building by the said Building Committee, in accordance with said plans.

Benjamin C. Clark spoke in favor of the motion and William C. Strong urged caution in taking so important a step.

There appearing to be a misunderstanding in regard to the time for which the meeting was called, an unofficial circular having stated it as eleven o'clock, it was voted, 25 to 6, to adjourn until eleven o'clock.

On reassembling the President stated that since the adjournment the Executive Committee had held a meeting, and that they had approved the additional appropriation of $60,000 asked for by the Building Committee, one member not voting.

The President again read the votes offered by Mr. Loring.

Joseph H. Woodford moved that the matter be divided and the two votes taken up separately. This motion was negatived.

Benjamin P. Ware spoke against the votes.

Mr. Loring moved that after the polls are opened they be closed at two o'clock. This motion was carried.

Henry L. Clapp asked what provision had been made for a Herbarium, and a motion was carried that the Building Committee be requested to consider this subject and provide a place for a Herbarium if possible.

George B. Dorr moved that a ballot now be taken on the votes moved by Mr. Loring and this vote was carried.

It was voted that the Chair appoint a Committee of five to receive, assort, and count the ballots given and report the number. The Chair appointed as this Committee Henry S. Adams, Patrick Norton, Edwin A. Hall, Miss C. M. Endicott, and Miss Mary C. Hewett.

The polls were closed at two o'clock, and the Committee made the following report:

The Committee appointed to receive, sort and count the ballots

cast at the special meeting on the 26th of May, 1900, upon the following votes:—

Voted, To approve and adopt the plans for a new building presented by the Building Committee at this meeting,—

Voted, To appropriate the sum of Sixty Thousand Dollars in addition to the sum heretofore appropriated for the erection of a building by the said Building Committee in accordance with said plans, report the total number of votes cast to be 196, of which 182 were yes and 14 no.

HENRY S. ADAMS, *Chairman*,
MARY C. HEWETT,
EDWIN A. HALL,
CHARLOTTE M. ENDICOTT.

COMMONWEALTH OF MASSACHUSETTS.

SUFFOLK, ss. BOSTON, May 26, 1900.

Then personally appeared the above named Henry S. Adams, Mary C. Hewett, Charlotte M. Endicott, and Edwin A. Hall, and made oath that the above return is correct.

(signed) CHARLES E. RICHARDSON, *Notary Public*.

The report was accepted and the meeting was then dissolved.

BUSINESS MEETING.

SATURDAY, June 2, 1900.

An adjourned meeting of the Society was holden at eleven o'clock today, the President, FRANCIS H. APPLETON, in the chair.

The President, as Chairman of the Committee to prepare a memorial of the late John Davis Williams French, presented the following, which was accepted and referred to the Committee on Publication:

John Davis Williams French, the son of Jonathan French, who is our oldest member, died at Atlantic City, N. J., May 2, 1900, and we mourn his loss.

His early home was in Roxbury, where, amid the productive and beautiful horticultural surroundings of those days he acquired his fondness for all out-of-door occupations.

Mr. French obtained his early training at the schools of Roxbury or Boston, and graduated at Harvard College in the Class of 1863.

After graduating he served as a valued member of the Christian Commission, with our army at the front.

In his agricultural work, results upon his lands at North Andover, Essex County, have proved him to have been a skillful farmer, horticulturist, and forester. He knew the value in agriculture of the wise application of intelligence thereto, and it was his earnest endeavor to impart and have imparted, such ideas to all those who could or would be benefited by such application and knowledge.

He has been an exhibitor and officer in this Society. On our Library Committee, and on our Committee on Lectures and Publication, it was his aim always to advance the quality and value of our Library and Lectures, in proportion as our funds would allow, and to bring our volumes before our members and students in horticulture as prominently as possible.

He was a strong advocate of better accommodations for our valuable library, both in shelf room, and in the conveniences for examining our books, but equally eager was he that the Hall accommodations should be improved so that the greatest possible number of our citizens should enjoy and profit by the beauty of such exhibitions as we were able to present.

This Society has been distinctly honored and benefited by a bequest of five thousand dollars for the increase of the Library, and of such books from his library as the Society shall select. Such an act shows a spirit of interest in the work assigned to this Society that is to be commended and encouraged.

His interest in all branches of Forestry and his activity in "Village Improvements" have made him useful and influential in National, as well as local, forestry matters.

His last effort in the cause of tree-culture was shown in his earnestness to complete the organization of the new Boston Common Society, with the object of aiding in the maintenance of our ancient Common in the best possible condition.

He was fond of high-class live-stock of all kinds, although his attention has been chiefly directed to Ayrshires, and in lesser degree to Guernsey breeds of cattle.

He was an earnest and active worker with mind, body, and

purse in the cause of Christianity within the Episcopal Church and outside of it, and in many places will he be greatly missed, and his place will be hard to fill.

Mr. French was at one time a member of the Boston Common Council from Ward 11, and at the time of his death was a Trustee of the State Agricultural College, President of the Bay State Agricultural Society, Vice-President of the American Forestry Association, and Vice-President of the Essex Agricultural Society.

We extend to his aged father, and other members of the family, our sincere sympathy.

FRANCIS H. APPLETON,
CHARLES W. JENKS,
BENJAMIN M. WATSON,
} *Committee.*

A deed conveying to Charles E. Cotting, *et al.*, trustees, the old "Horticultural Hall Estate," so-called, on Tremont, Bosworth, and Bromfield Streets, Boston, was then read and considered, and upon motion it was

Voted, That the President, Francis H. Appleton, be, and he hereby is, authorized and instructed to execute, acknowledge and deliver in the name and behalf of the Corporation the deed which has just been read; also to execute and accept a lease of the conveyed premises on such terms as he may consider proper.

The Secretary announced the receipt of letters from Clarence H. Clark, Ex-President of the Pennsylvania Horticultural Society, and Albert Viger, President of the National Horticultural Society of France, acknowledging with thanks, the Honorary Memberships to which they had been elected.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

MRS. GEORGE FRANCIS ARNOLD, of Brookline.
ABRAHAM B. COFFIN, of Winchester.
THEODORE DWIGHT, of Weston.
MISS MARY COFFIN JACOBS, of Dorchester.
JAMES S. RUSSELL, of Milton.

The meeting was then dissolved.

BUSINESS MEETING.

SATURDAY, July 7, 1900.

A duly notified stated meeting of the Society was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

In the absence of the Secretary, by reason of illness, the President appointed Miss Mary C. Hewett Secretary *pro tem.*

The President, as Chairman of the Executive Committee, presented a report from that Committee, recommending an additional appropriation of $3 for the Committee on School Gardens and Children's Herbariums, for prizes awarded in 1899, agreeably to the request of that Committee. The appropriation was unanimously voted.

The President also presented a report from the Executive Committee, recommending an additional appropriation of $60,000 asked for by the Building Committee, which was voted at a special meeting of the Society on the 26th of May, and now came up for final action. It was unanimously voted.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

FREDERICK C. MOSELEY, of Dorchester.
GEORGE J. PUTNAM, of Brookline.
DR. WILLIAM L. RICHARDSON, of Boston.

Adjourned to Saturday, August 4.

BUSINESS MEETING.

SATURDAY, August 4, 1900.

An adjourned meeting of the Society was holden at eleven o'clock today. In the absence of the President and Vice-Presidents, Ex-President William H. Spooner was called to the chair.

The Chair announced the following Committees appointed by the President:

On the Revision of the Constitution and By-Laws, provided for at the January meeting,

PRESIDENT FRANCIS H. APPLETON, *Chairman*.
WILLIAM J. STEWART, AUGUSTUS P. LORING,
CHARLES S. SARGENT, DR. HENRY P. WALCOTT.

On School Gardens, School Herbariums, and Children's Herbariums,

HENRY L. CLAPP, *Chairman*,
MISS KATHARINE W. HUSTON, MRS. H. L. T. WOLCOTT,
CHARLES W. JENKS, HENRY S. ADAMS,
WILLIAM P. RICH, WILLIAM E. C. RICH, *Secretary*.

On the Nomination of Officers and Standing Committees for the year 1901,

C. MINOT WELD, *Chairman*,
FRANCIS BLAKE, CHARLES W. JENKS,
WARREN H. HEUSTIS, CHARLES W. PARKER,
WALTER C. BAYLIES, ARTHUR HUNNEWELL.

Ex-President William C. Strong announced the decease of Charles H. B. Breck, for many years a Vice-President of the Society, and Chairman of the Committee of Arrangements, and moved the appointment of a Committee of three to prepare a memorial, and Mr. Strong, Charles B. Travis, and Joseph H. Woodford were accordingly appointed. Mr. Strong stated that it would be agreeable to Mr. Breck's family to have a representative of the Society among the pall-bearers, and Mr. Travis was requested to perform that duty.

Adjourned to Saturday, September 1.

BUSINESS MEETING.

SATURDAY, September 1, 1900.

An adjourned meeting of the Society was holden at eleven o'clock today, the President, FRANCIS H. APPLETON, in the chair.

Ex-President William C. Strong, Chairman of the Committee appointed at the last meeting to prepare a memorial of the late Charles H. B. Breck, presented the following report, which was accepted and ordered to be entered on the records of the Society.

BUSINESS MEETING.

SATURDAY, July 7, 1900.

A duly notified stated meeting of the Society was holden today at eleven o'clock, the President, FRANCIS H. APPLETON, in the chair.

In the absence of the Secretary, by reason of illness, the President appointed Miss Mary C. Hewett Secretary *pro tem.*

The President, as Chairman of the Executive Committee, presented a report from that Committee, recommending an additional appropriation of $3 for the Committee on School Gardens and Children's Herbariums, for prizes awarded in 1899, agreeably to the request of that Committee. The appropriation was unanimously voted.

The President also presented a report from the Executive Committee, recommending an additional appropriation of $60,000 asked for by the Building Committee, which was voted at a special meeting of the Society on the 26th of May, and now came up for final action. It was unanimously voted.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

FREDERICK C. MOSELEY, of Dorchester.
GEORGE J. PUTNAM, of Brookline.
DR. WILLIAM L. RICHARDSON, of Boston.

Adjourned to Saturday, August 4.

BUSINESS MEETING.

SATURDAY, August 4, 1900.

An adjourned meeting of the Society was holden at eleven o'clock today. In the absence of the President and Vice-Presidents, Ex-President William H. Spooner was called to the chair.

The Chair announced the following Committees appointed by the President:

On the Revision of the Constitution and By-Laws, provided for at the January meeting,

PRESIDENT FRANCIS H. APPLETON, *Chairman*.

WILLIAM J. STEWART,	AUGUSTUS P. LORING,
CHARLES S. SARGENT,	DR. HENRY P. WALCOTT.

On School Gardens, School Herbariums, and Children's Herbariums,

HENRY L. CLAPP, *Chairman*,

MISS KATHARINE W. HUSTON,	MRS. H. L. T. WOLCOTT,
CHARLES W. JENKS,	HENRY S. ADAMS,
WILLIAM P. RICH,	WILLIAM E. C. RICH, *Secretary*.

On the Nomination of Officers and Standing Committees for the year 1901,

C. MINOT WELD, *Chairman*,

FRANCIS BLAKE,	CHARLES W. JENKS,
WARREN H. HEUSTIS,	CHARLES W. PARKER,
WALTER C. BAYLIES,	ARTHUR HUNNEWELL.

Ex-President William C. Strong announced the decease of Charles H. B. Breck, for many years a Vice-President of the Society, and Chairman of the Committee of Arrangements, and moved the appointment of a Committee of three to prepare a memorial, and Mr. Strong, Charles B. Travis, and Joseph H. Woodford were accordingly appointed. Mr. Strong stated that it would be agreeable to Mr. Breck's family to have a representative of the Society among the pall-bearers, and Mr. Travis was requested to perform that duty.

Adjourned to Saturday, September 1.

BUSINESS MEETING.

SATURDAY, September 1, 1900.

An adjourned meeting of the Society was holden at eleven o'clock today, the President, FRANCIS H. APPLETON, in the chair.

Ex-President William C. Strong, Chairman of the Committee appointed at the last meeting to prepare a memorial of the late Charles H. B. Breck, presented the following report, which was accepted and ordered to be entered on the records of the Society.

IN MEMORY OF CHARLES HENRY B. BRECK.

Again we are called to mourn the loss of one of our oldest, most active, and most esteemed members. Charles Henry B. Breck entered the immortal life August 1, 1900, after an earthly life lacking but a single month of fourscore years. He was the only son of Hon. Joseph Breck, who was one of the original members of this Society, and a former President. The son inherited the tastes and love of flowers of his father, and very naturally entered with him into the business of seeds and agricultural wares. The long-established reputation of this house has been sustained from father to son, until it has become favorably known throughout the world.

Mr. C. H. B. Breck became a member of this Society in 1857, and continued his active connection from that date until the last year of his life, thus being exceeded in long continued service by but very few other members. In 1871 he was elected Chairman of the Committee of Arrangements, continuing to be elected to this office until 1883. In 1876 he was elected one of the Vice-Presidents, which office he held to the day of his death. He was also for several years a member of the Executive Committee and of other committees, and during this long service, and by his wide acquaintance and friendly intercourse with our members, he contributed largely to promote the interests of the Society. It is not for us to speak of his honorable and successful business career, his untarnished record as alderman of the City of Boston, and other offices which he held with honor. In our memory he will dwell as a genial companion, with whom we have had long and goodly fellowship and whose loss we sincerely mourn.

To the members of his family, who have had a lifelong experience of his strong attachments and his kindly interest in their welfare, which knew no limit, we extend our heartfelt sympathy in their loss.

We recommend that a copy of this expression be sent to the family of the deceased.

WILLIAM C. STRONG,
CHARLES B. TRAVIS,
J. H. WOODFORD. } *Committee.*

BOSTON, September 1, 1900.

The President announced that Benjamin H. Pierce, of Watertown, had made a bequest of one thousand dollars to the Society, the principal to be kept intact, and the income to be applied to the introducing of new fruits.

Warren Howard Heustis, from the Committee to nominate candidates for Officers and Standing Committees for the year 1901, presented a report, which was accepted. It was voted that the Committee be continued and requested to nominate candidates for any vacancies which may occur on the ticket.

The meeting was then dissolved.

BUSINESS MEETING.

SATURDAY, October 6, 1900.

A stated meeting of the Massachusetts Horticultural Society, being the Annual Meeting for the choice of Officers and Standing Committees, was holden at eleven o'clock today, the President, FRANCIS H. APPLETON, in the chair.

The Secretary stated that the meeting had been duly notified to the members of the Society, agreeably to the Constitution and By-Laws.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

GEORGE MACKIE, M. D., of Attleboro.
GUSTAVUS C. HOLT, of Belmont.
EDWARD E. COLE, of Boston.
JULIUS HEURLIN, of South Braintree.

On recommendation of the Executive Committee,

SIR TREVOR LAWRENCE, President of the Royal Horticultural Society, London, and

DR. HENRY S. PRITCHETT, President of the Massachusetts Institute of Technology, Boston,

were elected Honorary Members of the Society, and

HENRY H. GOODELL, President of the Massachusetts Agricultural College, Amherst, and

B. T. Galloway, Horticulturist and Superintendent of Gardens and Grounds of the United States Department of Agriculture, Washington, D. C.,

were elected Corresponding Members of the Society.

Agreeably to the Constitution and By-Laws the President appointed William C. Strong, Hon. Aaron Low, and Charles W. Jenks, a Committee to receive, assort, and count the votes given and report the number. The polls were opened at ten minutes past eleven o'clock, and closed at ten minutes past one o'clock, and the Committee reported that the persons named on the ticket presented by the Nominating Committee had a plurality of votes and were elected, except that O. B. Hadwen was elected President and member of the Finance Committee in place of Francis H. Appleton.

The report was accepted, and the persons reported by the Committee as elected were, agreeably to the Constitution and By-Laws declared by the President to have a plurality of votes, and to be elected Officers and Standing Committees of the Society for the year of 1901.

Adjourned to Saturday, November 3.

BUSINESS MEETING.

Saturday, November 3, 1900.

An adjourned meeting of the Society was holden today at eleven o'clock, the President, Francis H. Appleton, in the chair.

The President, as Chairman of the Executive Committee, reported a recommendation that the Society appropriate the following sums for Prizes and Gratuities for the year 1901:

For Prizes and Gratuities for Plants . . .	$2,000
" " " " " Flowers . . .	2,500
" " " " " Fruits . . .	1,700
" " " " " Vegetables . .	1,200
" " " " " Gardens . . .	500
" " " " " Native Plants . .	175
Total	$8,075

For School Gardens and Children's Herbariums .	$125
" Incidental Expenses of the last named Committee	75

The report was accepted, and, agreeably to the Constitution and By-Laws, laid over for final action on the first Saturday in January.

The Executive Committee also recommended that President elect O. B. Hadwen be added to the Building Committee, which was accordingly done.

A recommendation from the Executive Committee, that the Society take into favorable consideration the offer of Mr. Charles S. Sargent to arrange an exhibition at the opening of the Society's New Hall, was referred to the Committee of Arrangements.

On recommendation of the Finance Committee it was

Voted, That the bequest of John S. Farlow of $2,500 be used as a fund, and that the interest, at the rate of four per cent per annum, be used only for the purchase of books for the Library.

The Secretary read the following letter from H. H. Hunnewell:

WELLESLEY, 27 October, 1900.

Mr. R. Manning, *Secretary*,

Dear Sir: — I have to acknowledge the receipt of your letter informing me of my election as Chairman of the Finance Committee and a member of the Executive Committee of the Massachusetts Horticultural Society.

In expressing my thanks for the compliment, I feel obliged to add that having arrived at an age when one realizes the necessity of some relief from his cares and responsibilities, I am compelled to tender my resignation as a member of these two Committees and to beg to be excused from further service.

Truly yours,

H. H. HUNNEWELL.

On motion, Ex-Presidents William C. Strong, William H. Spooner, and Nathaniel T. Kidder were appointed a Committee to take into consideration the long continued and eminent services of Mr. Hunnewell to the Society and to prepare an expression of the feelings of the Society on his retirement, and also to nominate a candidate to fill the vacancies caused by his resignation.

William C. Strong moved as the sense of the Society that President Appleton be requested to retain the position of Chairman of the Building Committee until the New Hall shall be completed. The motion was unanimously carried.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

SAMUEL H. COLTON, of Worcester.
JOSEPH FRANCIS BRECK, of Allston.
ARCHIBALD SMITH, of West Somerville.

Adjourned to Saturday, December 1.

BUSINESS MEETING.

SATURDAY, December 1, 1900.

An adjourned meeting of the Society was holden at eleven o'clock today, the President, FRANCIS H. APPLETON, in the chair.

Ex-President William C. Strong, Chairman of the Committee appointed at the last meeting, on the occasion of the resignation by H. H. Hunnewell of the Chairmanship of the Finance Committee, to take into consideration his long continued and eminent services to the Society, and to prepare an expression of the feelings of the Society on his retirement, presented the following report:

The Committee to whom was referred the resignation of Mr. H. H. Hunnewell from the offices of Finance and Executive Committees have to report as follows:

For nearly fifty years it has been the good fortune of this Society to have had the active and liberal support of one of the foremost cultivators and patrons of landscape art in the country. Mr. Hunnewell's estate at Wellesley has for a long time been the Mecca for lovers of sylvan and floral beauty, where they were sure to find the rarest and most perfect specimens of every desirable tree or plant which money and skill could procure. In extent, variety, and perfection of culture it is believed that this place is unsurpassed, in this or in any other country. The exhibitions of

this Society have been regularly and largely supported by generous contributions from these collections. In addition to this support, Mr. Hunnewell has given his services on the Finance Committee for the past thirty-four years, and for the past nineteen years he has been its Chairman, at a time when many changes, investments, and transfers have taken place, thus making his clear judgment, large experience, and superior facilities, of great advantage to the Society.

It is therefore with much regret that we receive his request that he be released from further service on the Finance and Executive Committees. But we recognize his right to a well-earned release from this responsibility, and while we must accede to his request and accept his resignation, we can assure him that his past services are highly appreciated, and will ever be held in grateful remembrance by the Society. And it is our earnest hope that he may yet continue to witness and enjoy the enlarged influence of the Society, so successfully promoted by his skill and labors.

In further recognition of our indebtedness, and the appropriateness and felicity of continuing this service in the same line, your Committee would nominate Mr. Walter Hunnewell to the Chairmanship of the Finance Committee to fill the vacancy caused by the resignation of his honored father.

All of which is respectfully submitted by

WILLIAM C. STRONG,
WILLIAM H. SPOONER,
NATHANIEL T. KIDDER,
} *Committee.*

BOSTON, December 1, 1900.

The report was unanimously accepted, and Walter Hunnewell was unanimously chosen to the Chairmanship of the Finance Committee.

Francis H. Appleton was unanimously chosen to fill the vacancy on the Executive Committee caused by the election of Walter Hunnewell to the Chairmanship of the Finance Committee.

William J. Stewart, Chairman of the Committee on Establishing Prizes, presented the Schedule of Prizes for 1901, which was accepted and referred to the Committee on Publication. A printed statement of the changes made from the Schedule of 1900 was also presented.

The Annual Report of the Committee on Plants was presented by William Wallace Lunt, Chairman.

The Annual Report of the Committee on Flowers was presented by J. Woodward Manning, Chairman.

The Annual Report of the Committee on Fruits was presented by E. W. Wood, Chairman.

The Annual Report of the Committee on Vegetables was presented by Warren Howard Heustis, Chairman.

The Annual Report of the Committee on Gardens was presented by Patrick Norton, Chairman.

The Annual Report of the Committee of Arrangements was presented by Joseph H. Woodford, Chairman.

The Annual Report of the Committee on the Library was presented by William E. Endicott, Chairman.

William H. Spooner presented his Annual Report as Delegate to the State Board of Agriculture.

These eight reports were severally accepted and referred to the Committee on Publication.

The President, as Chairman of the Executive Committee, reported a recommendation that the Society appropriate the same sum as the present year, $250, for the use of the Committee on Lectures and Publication for the year 1901. The report was accepted, and, agreeably to the Constitution and By-Laws, was laid over until the first Saturday in January for final action.

After some discussion of a proposition to celebrate the opening of the New Hall by an exhibition of plants, etc., the following vote was passed:

That the Building Committee be authorized to hold a Special Exhibition to open the New Hall of the Society at such time as shall be possible, provided the Society is involved in no financial expense thereby.

The President read the following letter from Sir Trevor Lawrence, President of the Royal Horticultural Society, London:

BURFORD, DORKING, Nov. 3, 1900.

Dear Sir:—I have delayed acknowledging your esteemed letter of the 6th ult. in the hope that I might have the photograph you so kindly asked for to send with my response. I fear, however, that it must follow later.

Will you, therefore, be so kind now as to accept for yourself and to convey to the Massachusetts Horticultural Society, my grateful thanks for the honor the Society has conferred upon me. I accept it in the spirit of kindly good fellowship ever prevalent among gardeners, and as a token that in the States a cordial good feeling to the mother country prevails among her children, as does an affection for our kith and kin across the Atlantic here.

I am yours truly and faithfully,

TREVOR LAWRENCE,

President Royal Horticultural Society.

P. S. I rejoice to say that several young men educated in my garden have found happy and prosperous homes with you.

Acceptances and thanks were also received from Dr. Henry S. Pritchett, President of the Massachustts Institute of Technology, Honorary Member, and Henry H. Goodell, President of the Massachusetts Agricultural College, Amherst, and B. T. Galloway, Chief of the Horticultural Division of the United States Department of Agriculture, Washington, D.C., Corresponding Members.

The decease of William Saunders, late Horticulturist and Superintendent of Gardens and Grounds of the United States Department of Agriculture, Washington, D. C., was announced, and Benjamin P. Ware, Hon. Aaron Low, and J. Woodward Manning were appointed a Committee to prepare a memorial.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

GEORGE C. WALTHAM, of Dorchester.
ANDREW ROBESON SARGENT, of Brookline.
NATHAN MATTHEWS, JR., of Boston.

The meeting was then dissolved.

REPORT

OF THE

COMMITTEE ON PLANTS.

FOR THE YEAR 1900.

By WILLIAM WALLACE LUNT, CHAIRMAN.

The Committee on Plants herewith present to the Society their report for the year 1900.

At the beginning of the year your Committee received from President Appleton a communication suggesting that strict economy be kept to the fore in awarding prizes and that certain rules be more closely followed regarding the same. It has therefore been something of an experimental year, and while a higher standard has been established we regret that frankness compels us to state that it has not been as successful as we could wish.

The well nigh universal custom of awarding a Silver Medal to the *first* exhibitor of any *new* or *rare* plant, has been departed from in some cases, it being thought that where such plants were acquired by purchase it was an injustice to the party who originated it to award such high honor to one whose skill had not entered into its creation, and it has been deemed advisable in such cases to award a First Class Certificate of Merit.

Another problem which your Committee have endeavored to solve, is that of awarding prizes for *Superior Cultivation*, the question being, as to who is responsible for such cultivation, the owner of the plant, who has nothing whatever to do with its culture, or the gardener who cares for it daily and to whose skill and watchfulness is due its superior condition.

As the watchword has been *economy* for the past year, can we honestly state it has been a success? Have our exhibitions been

as large and of such excellence as of former years? To the first question we may reply yes and no. We certainly have had the exhibits presented in better condition, only two having been disqualified, and these for good and sufficient reasons, the remaining ones being of such excellence that they easily surpassed the new standard established. On the other hand, there have been exhibits of exceedingly rare and finely cultivated plants, which have been shown previously, though in smaller specimens, and these being judged by the new standard, have been awarded prizes for superior cultivation, which has been in accordance with the rules, but has resulted in two instances in the *gardeners* of the exhibitors declining to continue to exhibit.

It is also to be regretted that our exhibitions the past year have not been as large as formerly, and this brings us face to face with the question: Do our exhibitors show for prizes or for the love, encouragement, and advancement of horticulture? The advocates of that class whose aim is chiefly the advancement of horticulture, are, we regret to say, altogether out of proportion to those who exhibit for what they can get out of it in dollars and cents, and when the expense of carriage to and from the hall of large collections is taken into consideration, it is not to be wondered at, that the item of cost has to be considered.

As the exhibitions the coming year will be more or less interrupted owing to our removal to our new quarters, and as the expenditures in all departments will call for more or less extra expense—your Committee would ask that if deemed advisable in 1902, a prize or prizes be offered to the gardener or gardeners who during that year receive the greatest number of First Prizes.

It is a matter of congratulation that our exhibitors are endeavoring to make their exhibits instructive as well as pleasing to those who visit our Halls, and in this connection we would cite as examples the exhibits of the following:—

James E. Rothwell (John Mutch, gardener) on January 6 exhibited six varieties of the, so-called, yellow *Cypripedium insigne*, viz:

Ernestii,
Sanderæ,
Willie Millie Dow,
Laura Kimball,
Sanderianum,
Youngianum.

Ernesti. Laura Kimball. Sanderæ. Sanderianum. Youngianum. Willie Millie Dow.

Display of Cypripedium insigne – yellow varieties

By James E. Rothwell.

Display of Cypripedium insigne varieties
By Oakes Ames.

E. V. R. Thayer (E. O. Orpet, gardener) on Oct. 6:

Cattleya × *Thayeriana* (*C. intermedia* × *C. labiata Schrœderæ* var. *alba*), two plants

Cattleya × *Thayeriana* var. *superba* (*C. intermedia* × *C. labiata Schrœderæ* var. *alba.*), one plant

Laelia × *nigrescens* (*L. pumila* × *L. tenebrosa*) two plants

" × *juvenilis* var. *superba* (*L. pumila* var. *praestans* × *L. Perrinii*), three plants

Laelio-Cattleya C. G. Roebling, syn. *L.-C. violetta*, (*C. labiata* var. *Gaskelliana* × *L. purpurata*), one plant

Laelio-Cattleya Bletchleyensis (*C. Warscewiczii* (syn. *gigas*) × *L. tenebrosa*), one plant

Mrs. F. L. Ames (W. N. Craig, gardener) on Nov. 3:

The Langwater and Sander varieties of *Cypripedium* × *Olivia* var. *Miss Minnie Ames* (*C. niveum* × *C. Curtisii*—Ames) and (*C. Curtisii* × *C. niveum*—Sander)

Cypripedium × *Krishna* var. (*C. tonsum* × [*C. insigne* var. *Sanderæ*), seven plants

Cypripedium × (*C. tonsum* × *C. Charlesworthii*), two plants.

Cypripedium × *Leeanum* var. *pallida* (*C. insigne* var. *Sanderæ* × *C. Spicerianum*), one plant

Oakes Ames, (Robert M. Grey, gardener) on Nov. 24:

Cypripedium insigne var. *aureum*
" " " *Amesianum*
" " " *Ballæ*
" " " *citrinum*
" " " *Dorothy*
" " " *Ernestii*
" " " *Gilmoreianum*
" " " *Harefield Hall* (type)
" " " " " var. *Baron Schrœder*
" " " *Lutwichianum*
" " " *Laura Kimball*
" " " *Sanderæ*
" " " " *Hardy's* var. (true)
" " " *Willie Millie Dow*

Up to the time of Mr. Rothwell's exhibit it had been impossible for your Committee to get more than one variety of the so-called yellow *Cypripedium insigne* submitted for award at one time, whereby the different colorations and structure of the flowers could be compared, it being claimed by many that they were all alike, but a careful comparison proved the contrary.

In Mr. Thayer's exhibit was shown the desirable results which could be obtained by a judicious selection of parents for hybrids, and to what extent they vary, even those coming from the same seed pod showing great variation, and Mr. Thayer is to be congratulated in having such an able gardener who can apply scientific methods to obtain such results.

Of Mrs. Ames's exhibit the same may be said as of the foregoing, the plants exhibited showing great variety though having the same parentage, and they also showed that the late William Robinson had accomplished good work which others are ably bringing to maturity.

Mr. Ames's exhibit was as unique, as well as complete, as it was possible to make it, and from an educational standpoint it easily took first honors. In addition to the plants heretofore mentioned the exhibit also included a plant of *Cypripedium* × *Simonii* var. *obscuram* (natural hybrid) and *C.* × *Gravesiæ* (*C. niveum* × *C. Argus*) the latter receiving a First Class Certificate of Merit.

The plants of *Cattleya Trianæ* exhibited by Bayard Thayer (James Brydon, gardener) on Feb. 3 and Feb. 10 were marvellous specimens of superior cultivation, bearing from twenty-five to thirty flowers each.

Feb. 24, Walter P. Winsor exhibited *Dendrobium nobile*, Burford var., which was awarded a First Class Certificate of Merit with the request that it be shown again in 1901.

SPRING EXHIBITION.

March 20, 21, 22 and 23.

This was somewhat disappointing in some of the entries as the early warm weather had brought some varieties forward earlier than usual: so that the Cyclamens were past their best.

Cattleya Trianae
By Bayard Thayer.

March 31, Col. Charles Pfaff exhibited a remarkable specimen of *Dendrobium fimbriatum* var. *oculatum*, showing superior cultivation.

MAY EXHIBITION.

May 5.

At the May Exhibition, C. H. Souther submitted a new and improved variety of *Chrysanthemum Leucanthemum*, for which a First Class Certificate of Merit was awarded, and J. S. Bailey (William Donald, gardener) exhibited a new palm,—*Kentia Sanderiana*, receiving a Silver Medal for the same, it being considered an exceptionally fine variety.

May 19 Arthur Hunnewell exhibited three plants of Schizanthus which were fine examples of cultural skill, and obtained a First Class Certificate of Merit.

RHODODENDRON SHOW.

June 12 and 13.

At the Rhododendron Exhibition H. H. Hunnewell showed *Miltonia vexillaria* var. H. H. Hunnewell, a superb form, having all of its segments deeply colored, and Bayard Thayer showed a specimen plant of *Cattleya Warscewiczii* (syn. *gigas*) with five spikes bearing thirty-five flowers; both were awarded Silver Medals.

Saturday, July 14, H. Dumaresq exhibited specimen Hydrangeas, capturing all the prizes competed for in this class, as he did last year.

ANNUAL EXHIBITION OF PLANTS AND FLOWERS.

September 5 and 6.

The Annual Exhibition, Sept. 5 and 6, was smaller than in years past, many of the classes being without exhibits. It has been suggested that at this Exhibition there be a third prize offered for Collection of Greenhouse Plants (No. 443). At this Exhibition, a new introduction by Oakes Ames, of Caladium Oakes Ames was shown for the first time and received Honorable Mention.

Oct. 20 J. E. Rothwell (J. Mutch, gardener) exhibited *Cattleya* × *Maroni* (*C. velutina* × *C. aurea*) a Continental hybrid of rare merit, being not only pleasing in color, but extremely fragrant.

CHRYSANTHEMUM SHOW.

NOVEMBER 6, 7, 8 AND 9.

At the Chrysanthemum Exhibition, Nov. 6 to 9, inclusive, there were plants of this flower exhibited that exceeded any similar exhibit heretofore given, Mrs. B. P. Cheney (John Barr, gardener) taking the first place easily, the quality of the plants being such that they were shown at Newport and Providence the next week, competing successfully against plants fresh from local establishments after three transfers and journeys of many miles each.

The varieties which won for Mrs. Cheney first prizes in their respective classes were

Display of twelve plants, any or all classes:

Kate Broomhead.	Mutual Friend.
Lady Isabel.	Peter Kay.
Louis Boehmer.	Red Warrior.
Mrs. E. B. Freeman.	Shiloh.
Mrs. F. A. Constable.	Silver Cloud.
Mrs. J. G. Breer.	The Bard.

Three Reflexed, first prize:

Marion Henderson.	Red Warrior.
Mrs. J. Lewis.	

Three Reflexed, second prize:

Black Hawk.	Mrs. J. G. Breer.
Edith Smith.	

Specimen Reflexed:

First prize, Lady Hanham.
Second prize, Arethusa.

Three Japanse Incurved:

Georgiana Pitcher.	Mrs. H. Weeks.
Louis Boehmer.	

Specimen Incurved:

First prize, Golden Trophy.
Second prize, Georgiana Bramhall.

Third prize, Mongolian Prince.

Specimen Pompon: Savanah.

There were also shown by R. & J. Farquhar plants of the new Begonia Caledonia, a white sport from Begonia Gloire de Lorraine; while presenting a striking contrast it will have hard work to supplant the older variety.

Dr. C. G. Weld (Kenneth Finlayson, gardener,) exhibited three splendid specimens of *Erica Wilmoreana* and an excellent display of Chrysanthemums grown to single stem and bloom, which upheld the reputation that he has of sending none but the very finest and cleanest plants for exhibition.

It is to be regretted in connection with this exhibition that since the offering of prizes known as the Henry A. Gane Memorial Fund prizes, there have been no competitors. Upon diligent enquiry among Chrysanthemum experts, the opinion seems to be quite unanimous that the varieties originated by the late Henry A. Gane, are much more adapted to the production of *extra fine flowers* than to even fairly good specimen plants. Will not some of our growers try and prove the contrary, for surely we could imagine nothing finer than a well grown specimen plant of Mrs. Jerome Jones bearing its large and handsome flowers in profusion.

The Committee have again to express their sincere thanks to Oakes Ames for his assistance in many cases where questions of a scientific nature have arisen regarding exhibits, and for his generous gift of the collection of water color paintings, to be known as the "Ames Collection of Colored Drawings of Orchids."

Amount appropriated for Prizes and Gratuities .		$2,000 00
Prizes and Gratuities have been awarded amounting to	$1,609 00	
Estimated cost of Medals, . . .	229 60	
		1,838 60
Leaving an unexpended balance of . .		$161 40

Respectfully submitted,

WM. WALLACE LUNT,
JAMES WHEELER,
WM. J. MARTIN,
ARTHUR H. FEWKES,
ROBERT CAMERON.

Committee on Plants.

PRIZES AND GRATUITIES AWARDED FOR PLANTS. 1900.

JANUARY 6.

PRIMULA SINENSIS. — Six plants in not less than six-inch pots:

First, Mrs. John L. Gardner	$4 00
Second, Mrs. John L. Gardner	3 00
Third, Mrs. B. P. Cheney	2 00

PRIMULA STELLATA. — Six plants in not less than six-inch pots:

First, Mrs. B. P. Cheney	3 00
Second, Mrs. John L. Gardner	2 00

PRIMULA OBCONICA HYBRIDS. — Six plants in not less than six-inch pots:

First, Mrs. B. P. Cheney	4 00
Second, Mrs. B. P. Cheney	3 00
Third, Mrs. John L. Gardner	2 00

Gratuities:—

R. & J. Farquhar, Begonia Gloire de Lorraine var. compacta	6 00
J. W. Howard, Display of Primulas	2 00
Dr. C. G. Weld, Display of seedling Amaryllises	1 00

FEBRUARY 3.

Gratuities:—

Bayard Thayer, Specimen plant of *Cattleya Trianæ*	3 00
Mrs. John L. Gardner, Fourteen plants of *Primula Sinensis* var. *alba flore pleno*	2 00

FEBRUARY 10.

Gratuities:—

Edward Whitin, *Cattleya Trianæ* var.	2 00
Walter Hunnewell, *Oncidium Cavendishianum* var.	2 00

FEBRUARY 17.

Gratuities:—

Bussey Institution, Syringa (Lilac) var. Charles X	1 00
H. A. Wheeler, Display of Orchids, *Coelogyne cristata* and *Odontoglossum Rossii* var. *majus*	1 00

MARCH 10.

Gratuity:—

H. A. Wheeler, Display of Orchids, *Cattleya Schroderæ* and *Dendrobium Wardianum*	1 00

MARCH 17.

Gratuity:—

J. E. Rothwell, *Masdevallia* × *Henriettæ*	3 00

SPRING EXHIBITION.

MARCH 20, 21, 22, AND 23.

Theodore Lyman Fund.

INDIAN AZALEAS. — Specimen plant, named:

First, H. H. Rogers	$10 00
Second, Dr. C. G. Weld	8 00
Third, Dr. C. G. Weld	5 00

ERICAS. — Six, not less than three species:

First, Dr. C. G. Weld	6 00
Second, Bussey Institution	4 00

Society's Prizes.

ORCHID. — Single plant:

First, Bayard Thayer	12 00
Second, Mrs. John C. Whitin	10 00

STOVE OR GREENHOUSE PLANT. — Specimen, in bloom, other than Azalea or Orchid, named:

First, Dr. C. G. Weld	8 00
Second, Mrs. John L. Gardner	6 00

HARDWOODED GREENHOUSE PLANTS. — Four, in bloom:

First, Dr. C. G. Weld	10 00
Second, Mrs. John L. Gardner	8 00

CLIMBING ROSE. — Specimen plant, in bloom:

First, C. H. Souther	8 00
Second, C. H. Souther	6 00

HARDY FLOWERING DECIDUOUS SHRUBS, FORCED. — Four, of four distinct species, named:

First, Mrs. John L. Gardner	6 00
Second, Bussey Institution	4 00

HARDY PRIMROSES. — Twelve plants of distinct varieties:

First, Mrs. John L. Gardner	6 00
Second, Mrs. John L. Gardner	4 00

HARDY POLYANTHUSES. — Twelve plants of distinct varieties:

First, Dr. C. G. Weld	6 00
Second, Mrs. John L. Gardner	4 00
Third, Mrs. John L. Gardner	2 00

CYCLAMENS. — Ten plants:

First, Mrs. B. P. Cheney	15 00
Second, Mrs. B. P. Cheney	12 00

Ten plants in not over seven-inch pots:

First, Jason S. Bailey	8 00
Second, Jason S. Bailey	6 00
Third, Mrs. B. P. Cheney	4 00

Single plant:	
First, Mrs. B. P. Cheney	5 00
Second, C. H. Souther	4 00
CINERARIAS. — Six varieties:	
First, C. H. Souther	10 00
Second, Mrs. John L. Gardner	8 00
Third, Dr. C. G. Weld	6 00
Three varieties:	
First, C. H. Souther	6 00
Second, Mrs. John L. Gardner	5 00
Third, Dr. C. G. Weld	4 00
Single plant:	
First, Mrs. John L. Gardner	4 00
Second, C. H. Souther	3 00
Third, Dr. C. G. Weld	2 00
HYACINTHS. — Twelve named varieties in pots, one in each pot:	
First, Dr. C. G. Weld	6 00
Second, Mrs. John L. Gardner	4 00
Third, Mrs. John L. Gardner	3 00
Six named varieties in pots, one in each pot:	
First, Dr. C. G. Weld	5 00
Second, Mrs. John L. Gardner	4 00
Single named bulb, in pot:	
First, Dr. C. G. Weld	2 00
Second, Mrs. John L. Gardner	1 00
Three pans, not to exceed twelve inches, ten bulbs of one variety in each pan:	
First, Dr. C. G. Weld	6 00
Second, Mrs. John L. Gardner	4 00
Third, Mrs. John L. Gardner	3 00
Two pans, not to exceed twelve inches, ten bulbs of one variety in each pan:	
First, Dr. C. G. Weld	4 00
Second, Dr. C. G. Weld	3 00
Third, Mrs. John L. Gardner	2 00
Single pan, not to exceed twelve inches, with ten bulbs of one variety:	
First, Mrs. John L. Gardner	3 00
Second, Dr. C. G. Weld	2 00
TULIPS. — Six eight-inch pans, nine bulbs of one variety in each:	
First, Dr. C. G. Weld	4 00
Second, William S. Ewell & Son	3 00
Third, E. S. Converse	2 00
Three eight-inch pans, nine bulbs of one variety in each:	
First, Dr. C. G. Weld	3 00
Second, William S. Ewell & Son	2 00
Third, E. S. Converse	1 00

Three ten-inch pans, twelve bulbs of one variety in each:

First, Dr. C. G. Weld	5 00
Second, Dr. C. G. Weld	4 00
Third, E. S. Converse	3 00

POLYANTHUS NARCISSUS. — Four seven-inch pots, four bulbs in each, distinct varieties:

First, Dr. C. G. Weld	4 00
Second, Dr. C. G. Weld	3 00
Third, Mrs. John L. Gardner	2 00

JONQUILS. — Six pots or pans, not exceeding eight inches, the number of bulbs in each to be at the discretion of the grower:

First, Dr. C. G. Weld	4 00
Second, William S. Ewell & Son	3 00
Third, William S. Ewell & Son	2 00

NARCISSUSES. — Six eight-inch pans, distinct varieties, single or double:

First, Harry S. Rand	4 00
Second, Dr. C. G. Weld	3 00

Three eight-inch pans:

First, Dr. C. G. Weld	3 00
Second, Harry S. Rand	2 00

LILIUM LONGIFLORUM. — Four pots, not exceeding ten inches:

First, E. N. Pierce & Son	10 00
Second, E. N. Pierce & Son	8 00

LILIUM HARRISII. — Four pots, not exceeding ten inches:

First, Dr. C. G. Weld	10 00

LILY OF THE VALLEY. — Six pots or pans, not exceeding eight inches:

First, Bussey Institution	4 00
Second, Bussey Institution	3 00

CROCUSES. — Three boxes, each eight by twenty inches, three distinct varieties:

First, William S. Ewell & Son	3 00
Second, Bussey Institution	2 00

FREESIAS. — Six pots or pans:

First, Dr. C. G. Weld	3 00
Second, Mrs. John L. Gardner	2 00
Third, J. Burnett	1 00

IXIAS. — Six pots or pans, in varieties:

First, Dr. C. G. Weld	5 00

TRITONIAS. — Six pots or pans in varieties:

First, Dr. C. G. Weld	5 00

ROMAN HYACINTHS. — Six eight-inch pans, ten bulbs in a pan:

First, Bussey Institution	3 00
Second, Dr. C. G. Weld	2 00
Third, William S. Ewell & Son	1 00

GENERAL DISPLAY OF SPRING BULBS. — All classes:

First, William S. Ewell & Son	25 00
Second, Dr. C. G. Weld	20 00

Gratuities:—

Mrs. B. P. Cheney, Display of Rose Magna Charta	5 00
H. H. Rogers, Rhododendron Camille de Rohan	3 00
James Comley, *Rhododendron Veitchii*	2 00
H. A. Wheeler, Specimen Azalea	2 00
Rea Brothers, *Primula Sieboldi*	3 00
E. S. Converse, Display of Cyclamens	3 00
Walter Hunnewell, *Begonia Gilsoni*	3 00
Mrs. John L. Gardner, *Cineraria stellata*	2 00
E. N. Pierce & Son, Display of *Lilium longiflorum*	2 00
Bussey Institution, Display of *Begonia Verschaffeltii*	2 00
James Comley, *Genista alba*	2 00
Walter Hunnewell, *Bougainvillea Sanderiana*	1 00
Norris F. Comley, Display of Violets	2 00
Bussey Institution, Display of Forced Native Plants	5 00

MAY 5.

PELARGONIUMS. — Six named Show or Fancy varieties, in not less than eight-inch pots, in bloom:

First, E. J. Mitton	10 00
Second, C. H. Souther	8 00

INDIAN AZALEAS. — Six plants, in pots, named:

First, Dr. C. G. Weld	8 00

Single specimen:

First, Dr. C. G. Weld	3 00
Second, Dr. C. G. Weld	2 00

CALCEOLARIAS. — Six varieties, in pots:

First, Mrs. B. P. Cheney	10 00
Second, Mrs. B. P. Cheney	8 00
Third, Dr. C. G. Weld	6 00

Single plant:

First, Mrs. B. P. Cheney	3 00
Second, Mrs. B. P. Cheney	2 00
Third, Mrs. B. P. Cheney	1 00

ORCHIDS. — Display, named:

First, J. E. Rothwell	12 00

AMARYLLISES. — Six pots, distinct varieties:

First, J. S. Bailey	8 00
Second, J. S. Bailey	6 00

Gratuity:—

Dr. C. G. Weld, Display of *Lilium longiflorum* and Streptocarpus	5 00

MAY 26.

Gratuity:—

E. J. Mitton, *Cattleya* × *Schilleriana* 1 00

RHODODENDRON EXHIBITION.

JUNE 12 AND 13 (*postponed from* JUNE 6 AND 7).

ORCHIDS. — Display, arranged for effect, with foliage plants, in a space eight feet by five feet:

First, J. S. Bailey	30 00
Second, J. E. Rothwell	25 00
Third, Mrs. John L. Gardner	20 00

Gratuities:—

H. A. Wheeler, *Odontoglossum læve* var. *Reichenheimii*	1 00
Dr. C. G. Weld, Display of Pelargoniums	4 00
E. J. Mitton, " " "	5 00
Dr. C. G. Weld, Display of *Watsonia Ardernei* and *Cypripedium Lawrenceanum*	3 00

ROSE AND STRAWBERRY EXHIBITION.

JUNE 22 AND 23.

DECORATIVE PLANTS. — Group, named, arranged for effect, covering seventy-five square feet:

First, J. S. Bailey	30 00
Second, Mrs. John L. Gardner	25 00
Third, E. S. Converse	20 00

ORCHIDS. — Six plants, of six named varieties, in bloom:

First, J. E. Rothwell	15 00

Three plants, of three named varieties, in bloom:

First, J. E. Rothwell	10 00

TUBEROUS BEGONIAS. — Six pots of six varieties:

First, E. S. Converse	8 00

JUNE 30.

Gratuity:—

E. J. Mitton, *Cattleya gigas* 1 00

JULY 14.

HYDRANGEAS. — Pair in tubs:

First, H. Dumaresq	15 00
Second, H. Dumaresq	10 00

Single plant in tub or pot:

First, H. Dumaresq	5 00

ACHIMENES.—Six, in not over ten-inch pans or pots, of six varieties:

First, H. Dumaresq	5 00

Gratuity:—

H. Dumaresq, Specimen Hydrangea	3 00

AUGUST 11.

Gratuities:—

Edward Whitin, *Cattleya* × *Hardyana* var. *Robbiana*	3 00
W. J. Clemson, *Oncidium crispum*	1 00
Richard H. Kidder, *Ananassa sativa*	1 00

AUGUST 18

OUVIRANDRA FENESTRALIS:

First, E. S. Converse	6 00
Second, Mrs. John L. Gardner	4 00

Gratuity:—

E. S. Converse, *Cabomba aquatica*	2 00

ANNUAL EXHIBITION OF PLANTS AND FLOWERS.

SEPTEMBER 5 AND 6.

PALMS.—Pair, in pots or tubs not more than twenty-four inches in diameter:

First, J. S. Bailey	12 00

Pair, in pots not more than fourteen inches in diameter:

First, Dr. C. G. Weld	8 00
Second, Mrs. John L. Gardner	6 00

GREENHOUSE PLANTS.—Collection containing foliage plants of all descriptions, not to exceed forty plants, in pots or tubs:

First, Mrs. John L. Gardner	40 00
Second, J. S. Bailey	30 00

Six Greenhouse and Stove plants of different named varieties, two Crotons admissible:

First, Dr. C. G. Weld	25 00
Second, Mrs. John L. Gardner	20 00
Third, J. S. Bailey	15 00

TABLE DECORATION.—For fifteen covers, living plants, in one receptacle, only one entry admissible:

First, E. J. Mitton	10 00

FLOWERING GREENHOUSE PLANT. — Single specimen, named:

First, J. S. Bailey	8 00
Second, Dr. C. G. Weld	6 00

CALADIUMS. — Six named varieties:

First, Col. Charles Pfaff	8 00
Second, Col. Charles Pfaff	6 00

FERNS. — Specimen, other than Tree Fern:

First, J. S. Bailey	4 00
Second, W. H. Lincoln	3 00

LYCOPODS. — Four named varieties:

First, Dr. C. G. Weld	5 00

DRACÆNAS. — Six named varieties:

First, J. S. Bailey	8 00
Second, Dr. C. G. Weld	6 00

CROTONS. — Twenty-five plants, not less than eighteen named varieties, in not less than six-inch pots:

First, J. S. Bailey	12 00
Second, E. J. Mitton	10 00
Third, W. H. Lincoln	8 00

Six named varieties, in not less than eight-inch pots:

First, W. H. Lincoln	10 00

CYCAD. — Single plant, named:

Second, Dr. C. G. Weld	8 00
Third, J. S. Bailey	6 00

Gratuities: —

Mrs. John L. Gardner, Display of *Gesneria bulbosa*	3 00
Arthur F. Estabrook, Display of Adiantums and Begonias	3 00

SEPTEMBER 15.

Gratuity: —

H. Carstens, *Oncidium ornithorhynchum*	1 00

ANNUAL EXHIBITION OF FRUITS AND VEGETABLES.

SEPTEMBER 27 AND 28.

DECORATIVE PLANTS. — Display, not less than forty, not to exceed three feet in height, to be arranged by the Committee:

First, Mrs. John L. Gardner	20 00
Second, E. S. Converse	15 00

OCTOBER 6.

Gratuities: —

Oakes Ames, Display of Orchids	3 00
H. A. Wheeler, " " "	2 00

CHRYSANTHEMUM EXHIBITION.

NOVEMBER 6, 7, 8, AND 9.

CHRYSANTHEMUMS. — Display of twelve named plants, any or all classes, distinct varieties:

First, Mrs. B. P. Cheney	60 00
Third, E. S. Converse	40 00

Display of ten named plants, any or all classes, distinct varieties, in not exceeding nine-inch pots:

Second, E. S. Converse	25 00

Three Japanese Incurved:

First, Mrs. B. P. Cheney	12 00

Three Reflexed, distinct named varieties:

First, Mrs. B. P. Cheney	12 00
Second, Mrs. B. P. Cheney	10 00

Four Anemone Flowered, distinct named varieties:

First, E. S. Converse	8 00

Specimen Incurved, named variety:

First, Mrs. B. P. Cheney	6 00
Second, Mrs. B. P. Cheney	5 00
Third, Mrs. B. P. Cheney	4 00

Specimen Reflexed, named variety:

First, Mrs. B. P. Cheney	6 00
Second, H. H. Rogers	5 00
Third, Mrs. B. P. Cheney	4 00

Specimen Anemone Flowered, named variety:

Second, E. S. Converse	5 00

Specimen Pompon, named variety:

First, Mrs. B. P. Cheney	4 00

Twelve plants, of twelve different varieties, grown to one stem and bloom, in not over six-inch pots, preference being given to plants not over three feet in height:

First, Dr. C. G. Weld	8 00
Second, E. S. Converse	6 00
Third, H. Dumaresq	4 00

Six plants grown as above, but all of one color, Red:

First, H. Dumaresq	4 00
Second, J. Nicol	3 00
Third, E. S. Converse	2 00

White:

First, Dr. C. G. Weld	4 00
Second, J. Nicol	3 00
Third, E. S. Converse	2 00

Pink:

First, H. Dumaresq	4 00
Second, Dr. C. G. Weld	3 00
Third, Dr. C. G. Weld	2 00

Yellow:
First, J. Nicol 4 00
Second, J. Nicol 3 00
Third, Dr. C. G. Weld 2 00
Any other color:
First, Dr. C. G. Weld 4 00
Second, Dr. C. G. Weld 3 00
Third, Dr. C. G. Weld 2 00
Six plants grown to bush form, in not over eight-inch pots, without stakes:
First, Francis Blake 8 00
Second, H. H. Rogers 6 00
Group arranged for effect, with palms and decorative foliage plants, limited to one hundred square feet:
First, Mrs. John L. Gardner 25 00

Gratuities:—

Dr. C. G. Weld, Display of Chrysanthemums grown to single stem 7 00
Dr. C. G. Weld, Display of *Erica Wilmoreana* 5 00
Lager & Hurrell, Summit, N. J., Display of Orchids . . . 25 00
William W. Edgar, Display of Ferns, Crotons, etc. . . . 8 00

NOVEMBER 17.

Gratuities:—

Mrs. F. L. Ames, Display of Orchids 3 00
H. Carstens, *Stanhopea oculata* 1 00

NOVEMBER 24.

Gratuity:—

H. A. Wheeler, *Zygopetalum Mackayi* var. *cærulescens* . . . 2 00

DECEMBER 8.

ORCHIDS. — Six plants, named varieties, in bloom:
First, H. A. Wheeler 15 00
Three plants, named varieties, in bloom:
First, H. A. Wheeler 10 00
Second, Mrs. John L. Gardner 8 00
Single plant, in bloom:
First, H. A. Wheeler 5 00
Second, Mrs. John L. Gardner 4 00

Gratuities:—

W. J. Clemson, *Oncidium tigrinum* 1 00
E. S. Converse, Display of Poinsettias 6 00

SOCIETY'S GOLD MEDALS.

May 26. E. O. Orpet, for the best American Seedling Orchid, other than Cypripedium, exhibited during the year, *Sophro-Laelia laeta* var. *Orpetiana (L. pumila* × *S. grandiflora)*.

October 6. E. V. R. Thayer. Display of Cattleyas and Laelio-Cattleyas (American seedlings).

Cattleya × *Thayeriana (C. intermedia* × *C. labiata Schroderæ alba)*, two plants.

Cattleya × *Thayeriana* var. *superba (C. intermedia* × *C. labiata Schroderæ alba)*, one plant.

Laelia × *nigrescens (L. pumila* × *L. tenebrosa)*, two plants.

Laelia × *juvenilis*, var. *superba (L. pumila* var. *praestans* × *L. Perrinii)*, three plants.

Laelio-Cattleya × C. G. Roebling *(C. labiata* var. *Gaskelliana* × *L. purpurata)*, three plants.

Laelio-Cattleya × *Bletchleyensis (L. tenebrosa* × *C. Warscewiczii*, syn., *gigas)*, one plant.

SOCIETY'S SILVER MEDALS.

January 6. J. E. Rothwell, Display of yellow varieties of *Cypripedium insigne:*

C. insigne var. *Sanderæ*.
" " " *Sanderianum*.
" " " *Youngianum*.
" " " *Willie Millie Dow*.
" " " *Ernestii*.
" " " *Laura Kimball*.

January 13. Oakes Ames, for Cypripedium × Miss Evelyn Ames *(C.* × *Calypso* var. *superba* × *C.* × *Leeanum* var. *superba)* (American Seedling).

February 17. Oakes Ames, for *Cattleya Schroderæ* var. *alba*.

" 24. J. E. Rothwell, for *Cypripedium* × *Leander (C. villosum* var. *aureum* × *C. Leeanum* var. *Lowii)*.

April 21. J. E. Rothwell, for *Laelia Jongheana*.

May 5. J. S. Bailey, for *Kentia Sanderiana* (new palm).

" 12. J. E. Rothwell, for *Cattleya* × *Schilleriana (C. Aclandiæ* × *C. guttata)*.

" 19. H. H. Hunnewell, for Superior Cultivation of *Cattleya Mossiæ* × and *C. Skinneri*.

Rhododendron Exhibition, June 12 and 13. H. H. Hunnewell, for *Miltonia vexillaria* var. *H. H. Hunnewell*.

" " " " Bayard Thayer, for superior cultivation of *Cattleya gigas* (thirty-five flowers).

Sophro-Laelia laeta var Orpetiana
By E. O. Orpet.

July 14. Oakes Ames for *Cypripedium* × *W. R. Lee* (*C. superbiens* × *C. Elliottianum*).

September 22. Oakes Ames, for *Cypripedium* × *Oakes Ames* (*C. Rothschildianum* × *C. ciliolare*).

November 3. Mrs. F. L. Ames, for Display of American Hybrid Cypripedlums.

Cypripedium × *Olivia* var. *Miss Minnie Ames* (Langwater var. *C. niveum* × *C. tonsum*).

Cypripedium × *Olivia* var. *Miss Minnie Ames* (Sander var. *C. tonsum* × *C. niveum*).

Cypripedium × *Krishna* var.

(*C. tonsum* × *C. insigne* var. *Sanderæ*) seven plants.

Cypripedium × *Tonsum-Charlesworthii*.

(*C. tonsum* × *C. Charlesworthii*) two plants.

Cypripedium × *Leeanum*, var.

(*C. insigne*, var. *Sanderæ* × *C. Spicerianum*).

November 24. Oakes Ames, for Display of varieties of *Cypripedium insigne*:

Cypripedium insigne var. *aureum*.
" " " *Amesianum*.
" " " *Ballæ*.
" " " *citrinum*.
" " " *Dorothy*.
" " " *Ernestii*.
" " " *Gilmoreianum*.
" " " *Harefield Hall* (type).
" " " " " var. *Baron Schroder*.
" " " *Lutwichianum*.
" " " *Laura Kimball*.
" " " *Sanderæ*.
" " " " . (Hardy's var.)
" " " *Willie Millie Dow*.

November 24. Oakes Ames, for *Cypripedium insigne Harefield Hall* var. *Baron Schroder*.

E. V. R. Thayer, second prize for best American Seedling Orchid, other than Cypripedium, exhibited during the year, *Cattleya* × *Thayeriana* (*C. intermedia* × *C. Schroderæ* var. *alba*).

BRONZE MEDALS.

June 22. W. A. Manda, third prize for best American Seedling Orchid, other than Cypripedium, exhibited during the year, *Laelio-Cattleya* × *Bletchleyensis* (*C. gigas* × *L. grandis* var. *tenebrosa*).

December 29. Mrs. F. L. Ames, for superior cultivation of *Cypripedium* × *Charles Canham* (twenty-seven flowers).

FIRST CLASS CERTIFICATES OF MERIT.

January 6. J. E. Rothwell, for *Cypripedium insigne* var. *Sanderianum*.

" " J. E. Rothwell, for " " " *Youngianum*.

" " J. E. Rothwell, for " " " *Willie Millie Dove*.

" " Oakes Ames, for " " " *Sanderianum*.

" 13. Oakes Ames, for *Cypripedium* × *Marwoodi* (*C. niveum* × *C.* × *Harrisianum*).

January 20. J. E. Rothwell, for *Cypripedium* × *Koffmanianum* (*C. insigne* × *C. Boxallii*).

February 10. Bayard Thayer, for superior cultivation of *Cattleya Trianæ*.

" " Edward Whitin, for *Cattleya Trianæ* var. *Amesiana*.

" 24. Walter P. Winsor, for *Dendrobium nobile*, Burford var.

March 10. Oakes Ames, for *Cattleya intermedia* var. *alba*.

Spring Exhibition, March 20–23. Jackson Dawson, for hybrid Polyantha Rose Little Tot.

March 31. Col. Charles Pfaff, for *Dendrobium fimbriatum* var. *oculatum*.

May 5. C. H. Souther, for *Chrysanthemum Leucanthemum*.

" 19. Arthur Hunnewell, for superior cultivation of Schizanthus.

Annual Exhibition of Plants and Flowers, September 5 and 6. Oakes Ames, for *Cypripedium* × *Thorntonii* (*C. superbiens* × *C. insigne*).

September 15. H. A. Wheeler, for *Stanhopea Bucephalus* var. *guttata*.

" 22. Oakes Ames, for superior cultivation of *Epidendrum Godseffianum* (*E. Capartianum*).

" " Oakes Ames for superior cultivation of *Stelis Rodriguesii*.

October 20, James E. Rothwell, for *Cattleya* × *Maroni* (*C. velutina* × *C. aurea*).

Chrysanthemum Exhibition, November 6, 7, 8, and 9. R. & J. Farquhar, for Begonia Caledonia (white sport of Gloire de Lorraine).

November 17. Mrs. F. L. Ames, for *Laelio-Cattleya* × *Lady Rothschild* (*C. Warscewiczii* × *L. Perrinii*).

November 24. Oakes Ames, for *Cypripedium insigne* var. *Dorothy*.

" " Oakes Ames, for *Cypripedium* × *Gravesiæ* (*C. niveum* × *C. Argus*).

December 15. James E. Rothwell, for superior cultivation of *Odontoglossum* × *Andersonianum*.

December 29. Mrs. F. L. Ames, for superior cultivation of *Laelio-Cattleya Digbyano-Mossiæ* and *Cypripedium Sallierii* var. *aureum*.

HONORABLE MENTION.

January 6. Harvard Botanic Garden, for *Platyclinis uneata*.

February 10. Harvard Botanic Garden, for *Calla Pentlandii*.

Spring Exhibition, March 20–23. Yamanaka & Co., for Display of Japanese Plants.

April 21. Norris F. Comley, for seedling Iris, var. *lævigata*.

July 21. Oakes Ames, for Cattleya Rex.

Annual Exhibition of Plants and Flowers, September 5 and 6.

Oakes Ames, for Caladium Oakes Ames (new introduction).

Oakes Ames, for Display of seedling Caladiums.

REPORT

OF THE

COMMITTEE ON FLOWERS.

FOR THE YEAR 1900.

By J. WOODWARD MANNING, CHAIRMAN.

The season of 1900 has been fully as successful as those of past years, although somewhat devoid of the usual number of new exhibits that call for special mention. We have had to pass through a repetition of the unusual dry weather conditions that prevailed in 1899, which, of course, has had its effect to a more or less serious extent in some of the classes of exhibits.

SPRING EXHIBITION.

MARCH 20, 21, 22, AND 23.

At the Spring Exhibition the dearth of exhibits of forced Roses was very noticeable. Many of the scheduled prizes had no competition. The exhibitions of Carnations, however, were very good and the competition was quite close.

On April 5, a Silver Medal was awarded to David Monteith for his new Carnation, Beulah, a very promising variety, of rich pink color and with unusual vigor and strength in stem.

MAY EXHIBITION.

MAY 5.

On May 5, a Silver Medal was awarded to the Floral Exchange, Incorporated, Philadelphia, for the new rose, Queen of Edgely.

At the time of its exhibition this seemed very promising, in that the general effect was in shape and size that of the American Beauty, while the color was a soft pink. Other exhibits of the same rose, however, made later in the season, did not show the plant to as good advantage as the first.

RHODODENDRON SHOW.

JUNE 12 AND 13.

The Rhododendron Show, postponed from June 6 and 7, brought out the usual amount of competition and the trusses and variety in flowers were fully up to the usual standard.

PÆONY EXHIBITION.

JUNE 16.

This proved one of the noteworthy shows of the season. Competition was very brisk and the display of flowers was ample in quantity and of the highest possible quality. The indications are that the Pæony will remain one of our most popular flowers and its adaptability to varied uses was well shown in the staging of the exhibits and arrangements in the vases.

ROSE AND STRAWBERRY SHOW.

JUNE 22 AND 23.

At the Rose Show of June 22 and 23, we were unfortunate in the weather conditions, which had practically reproduced the same scarcity of desirable flowers as had occurred in the season of 1899. Although there was an abundance of flowers, they lacked that quality that is so essential to make an exhibition successful in every sense of the word. At this exhibition, Jackson Dawson brought and was awarded a Silver Medal for the rose, Lady Duncan, a cross in which *Rosa rugosa* is one of the parents, producing a flower of soft pink color and apparently borne in great profusion.

On June 30, the exhibition of *Iris Kæmpferi* and Delphiniums was perhaps as fine as has been seen for a number of years past.

On July 7, when Hollyhocks are usually shown, the exhibition failed to bring forth that competition that used to be a feature of

our exhibits, indicating that the Hollyhock disease has become so very widespread as to practically wipe out of existence those fine collections that formerly added so much to the exhibitions of the year. On this date Michael H. Walsh exhibited a Rose, a very fine cross between *Rosa Wichuraiana* and Bridesmaid, called Sweetheart, for which your Committee awarded a Silver Medal. In this rose there was united that prolific bloom with rich fragrance and fine form in bud and flower that go so far to make the ideal rose. The delicate flesh colored flowers, which contrast well against the glossy, finely cut foliage, render it apparently one of the finest of semi-prostrate roses that has been shown before the Society for many years.

On July 14, Kenneth Finlayson, gardener to Dr. C. G. Weld, exhibited flowers of *Gerbera Jamesonii*, a South African composite, which attracted much attention as it is very noteworthy in that it displays the most intense shade of crimson-scarlet, which color is so extremely rare in the compositæ. Your Committee awarded a First Class Certificate of Merit for this exhibit.

The exhibits of Gladioli on and after August 18, were unusually fine throughout their season. The spikes seemed to be displayed to far better advantage than ever before and the great range in color that was shown in their classes as well as the variety of classes shown indicated a renewed interest and suggests that the flower is by no means losing its popularity.

Commencing with August 25, Dahlias were shown and continued a feature of the exhibition until hard frost stopped the growth of the plants. The great variety shown, more particularly in the Show and Fancy sections, as well as the quality of individual flowers, was an indication of careful culture as well as evidence of the improvements that are constantly being effected in these classes. The increased quantity and variety of the Cactus, Single, and Decorative classes, evidenced the great strides that this section is making and that they soon will prove formidable rivals to the more stiff and formal flowers in the Show and Fancy sections. Their brilliancy and range in coloring unite with their graceful character to make this section a most promising one for the future.

ANNUAL EXHIBITION OF PLANTS AND FLOWERS.

SEPTEMBER 5 AND 6.

The exhibition of September 5 and 6, in which Dahlias were the principal feature, was very successful and received great attention from the public. While the unfortunate tendency toward stiff and formal arrangement of these flowers has not been entirely dropped by the exhibitors, there does seem to be a decided advance in this respect and probably this undesirable feature will cease to be evident hereafter.

CHRYSANTHEMUM SHOW.

NOVEMBER 6, 7, 8, AND 9.

The Chrysanthemum Show of November 6 to 9 proved to be the crowning feature of the year's exhibition. Throughout the show the competition was very brisk and the quality of the flowers was fully as fine as has ever been seen at any of our exhibitions. The innovation whereby the Society's large vases were newly filled for new awards each day of the exhibition brought forth the strongest possible competition and the quality and artistic arrangement of the flowers could not be excelled. Several new exhibitors entered into the competition and their exhibits indicated the very highest skill in growing this class of flowers.

The year's exhibitions have been quite noteworthy in the repeated displays of Hardy Herbaceous Perennials, the interest in the class seeming to have taken a new lease of life, and throughout the season there were at frequent intervals, large and extremely interesting and beautiful exhibits made of this class of plants.

Your Committee has awarded during the year of 1900 $2,304.00, exclusive of the cost of Medals and First Class Certificates of Merit, which will be deducted from the balance of $227.50.

Respectfully submitted,

J. WOODWARD MANNING,

Chairman Flower Committee.

PRIZES AND GRATUITIES AWARDED FOR FLOWERS.

1900.

January 6.

PRIMULA SINENSIS. — Display of fifty or more individual blooms:

First, Mrs. John L. Gardner	$2 00
Second, Walter E. Coburn	1 00

FREESIAS. — Vase of fifty spikes:

First, William N. Craig	2 00
Second, Mrs. E. M. Gill	1 00

Gratuities:—

W. N. Craig, Vase of Cypripediums	3 00
J. W. Howard, Vase of Carnations	2 00
Mrs. E. M. Gill, Display	1 00

February 3.

ORCHIDS. — Display of named species and varieties, filling not less than twenty bottles:

First, E. O. Orpet	15 00
Second, James E. Rothwell	10 00

VIOLETS. — Best collection of varieties, fifty blooms of each in a bunch:

First, Norris F. Comley	4 00

CARNATIONS. — Display of cut blooms with foliage, not less than six varieties, in vases:

First, M. A. Patten	8 00

CAMELLIAS. — Display of named varieties, cut flowers with foliage, not less than twelve blooms, in not less than six varieties:

First, James Comley	4 00

Gratuities:—

H. A. Wheeler, Display of Orchids	4 00
Mrs. A. W. Spencer, Display of Orchids and Violets	2 00
James Comley, Display of Violets	2 00
John L. Bird, *Acacia pubescens*	2 00
W. E. Coburn, Display of Primulas	2 00
Norris F. Comley, Pansies	1 00
James Anderson, Narcissus	1 00
Mrs. E. M. Gill, Display	1 00

February 10.

Gratuity:—

James Comley, Violets	2 00

FEBRUARY 24.

Gratuities:—

A. A. Thorndike, Pansies	1 00
Mrs. E. M. Gill, Vase of Flowers	1 00
James Comley, Display	3 00

MARCH 3.

Gratuity:—

James Comley, Display	3 00

MARCH 10.

Gratuities:—

L. E. Marquisee, Syracuse, N. Y., Vase of Carnation The Marquis	2 00
M. A. Patten, Display of Carnations	3 00
D. Carmichael, Two Vases of Carnations	2 00
C. W. Ward, Display	5 00
James Comley, "	3 00
John Anderson, "	1 00

MARCH 17.

Gratuity:—

J. E. Rothwell, *Phalænopsis grandiflora*	2 00

SPRING EXHIBITION.

MARCH 20, 21, 22 and 23.

HYBRID PERPETUAL ROSES.—Twelve blooms in not less than four named varieties:	
First, C. H. Souther	12 00
Second, Col. Charles Pfaff	10 00
Six blooms, not less than three named varieties:	
First, Col. Charles Pfaff	6 00
Second, C. H. Souther	5 00
TENDER ROSES IN VASES.—Twelve blooms of American Beauty:	
First, F. R. & R. M. Pierson, Tarrytown, N. Y.	15 00
Twenty-five blooms of The Bride:	
First, W. H. Elliott	10 00
Twenty-five blooms of Bridesmaid:	
First, W. H. Elliott	10 00
Twenty-five blooms of Meteor:	
First, W. H. Elliott	10 00
Vase of fifty blooms, assorted varieties:	
First, J. W. Howard	20 00
Second, Miss M. S. Walker	16 00
CARNATIONS.—Vase of one hundred cut blooms, with foliage, not less than six varieties:	
First, M. A. Patten	8 00

Second, Col. Charles Pfaff	6 00
Third, J. W. Howard	4 00
Twenty-five blooms of any named Crimson variety:	
First, M. A. Patten, for Ferdinand Mangold	3 00
Twenty-five blooms of any named Dark Pink variety:	
First, M. A. Patten, for Mrs. F. Joost	3 00
Twenty-five blooms of any named Light Pink variety:	
First, Briarcliffe Greenhouses, Tarrytown, N. Y., for Mrs. James Dean	3 00
Twenty-five blooms of any named Scarlet variety:	
First, Briarcliffe Greenhouses, for G. H. Crane	3 00
Second, M. A. Patten, for G. H. Crane	2 00
Twenty-five blooms of any named White variety:	
First, Briarcliffe Greenhouses, for White Cloud	3 00
Second, M. A. Patten, for White Cloud	2 00
Twenty-five blooms of any named Yellow Variegated variety:	
First, Briarcliffe Greenhouses, for Golden Nugget	3 00
Twenty-five blooms of any named White Variegated variety:	
First, Briarcliffe Greenhouses, for Mrs. G. M. Bradt	4 00
Second, M. A. Patten, for Mrs. G. M. Bradt	3 00
PANSIES.—Forty-eight blooms, not less that twenty-four varieties, in flat dishes:	
First, W. C. Ward	3 00
Second, W. C. Ward	2 00
VIOLETS.—Bunch of one hundred blooms of Lady Hume Campbell:	
First, Norris F. Comley	3 00
Bunch of one hundred blooms of Marie Louise:	
First, Norris F. Comley	3 00
Bunch of one hundred blooms of any other double variety:	
First, Norris F. Comley	3 00
Bunch of one hundred blooms of any single variety:	
First, Norris F. Comley, for Princess of Wales	3 00
Second, Norris F. Comley, for California	2 00

Gratuities:—

J. W. Howard, Vase of Roses	5 00
Col. Charles Pfaff, Display of Roses	3 00
George M. Anderson, Vase of Carnations	2 00
James Comley, Violets and Camellias	5 00
J. W. Howard, Vase of Antirrhinums	3 00
M. R. Cushing, Antirrhinums	1 00
E. N. Pierce & Sons, Boston Market Mignonette	2 00
H. A. Wheeler, Display of Orchids	3 00
James Comley, General Display	6 00
Charles H. Souther, Display	3 00
Mrs. E. M. Gill, "	2 00

APRIL 7.

Gratuities:—

J. E. Rothwell, Display of Orchids	2 00
Mrs. E. M. Gill, Display	2 00

APRIL 21.

Gratuity:—

Mrs. E. M. Gill, Display	2 00

APRIL 28.

Gratuities:—

James Comley, Rhododendrons	4 00
Mrs. E. M. Gill, Display	1 00

MAY 5.

TULIPS. — Forty-eight blooms, not less than twelve named varieties:	
First, Edward Powell	4 00
HARDY NARCISSUSES. — Collection of fifty vases of not less than ten named varieties:	
First, Dr. C. G. Weld	8 00
Second, Edward Powell	6 00
PANSIES. — Forty-eight blooms, not less than twenty-four varieties, in flat dishes:	
Second, Mrs. E. M. Gill	3 00

Gratuities:—

Edward Powell, Display of Tulips	2 00
Norris F. Comley, Japan Irises	1 00
H. A. Wheeler, Display of Orchids and Gloxinias	3 00
James Comley, Display	5 00
Mrs. E. M. Gill, "	1 00

MAY 19.

Gratuities:—

Edward Powell, Vase of Carnations	1 00
F. O. Willard, Carnations and Antirrhinums	1 00
Edward Powell, Display of Tulips and Pansies	2 00
Blue Hill Nursery, Herbaceous Plants	8 00
Edward Powell, Display	3 00
Mrs. E. M. Gill, "	1 00

MAY 26.

Gratuities:—

Dr. C. G. Weld, Display	3 00
Mrs. E. M. Gill, "	1 00

JUNE 2.

Gratuities:—

T. C. Thurlow, Tree Pæonies, Azaleas, and other shrubs	3 00
Mrs. E. M. Gill, Cut Flowers	1 00

JUNE 9.

Gratuities:—

H. H. Hunnewell, Rhododendrons	5 00
James Anderson, Tree Pæonies	3 00
Charles W. Parker, Vase of Iris	1 00
Mrs. E. M. Gill, Display	1 00

RHODODENDRON EXHIBITION.

JUNE 12 AND 13 (POSTPONED FROM JUNE 6 AND 7).

H. H. Hunnewell Fund.

RHODODENDRONS. — Twelve distinct varieties of unquestioned hardiness, named:	
First, Mrs. John L. Gardner	20 00
Six distinct varieties, of unquestioned hardiness, named:	
First, Mrs. B. P. Cheney, Sr.	10 00
Six tender varieties, named:	
Second, Mrs. John L. Gardner	4 00
Single Truss of any tender variety, named:	
First, Mrs. John L. Gardner	2 00
HARDY AZALEAS FROM ANY OR ALL CLASSES. — Fifteen varieties, one vase of each:	
First, T. C. Thurlow	8 00
Twelve varieties, one vase of each:	
First, T. C. Thurlow	4 00
Six varieties, one vase of each:	
First, Mrs. John L. Gardner	3 00
Cluster of trusses:	
First, T. C. Thurlow	2 00

Society's Prizes.

PÆONIA OFFICINALIS. — Collection of named varieties:	
Second, T. C. Thurlow	4 00
TREE PÆONIES. — Collection of single and double varieties, named:	
First, W. A. Jeffries	6 00
GERMAN IRISES. — Thirty-six vases of three trusses each, of not less than twelve varieties:	
First, Mrs. John L. Gardner	4 00
Third, Rea Brothers	2 00
HARDY PYRETHRUMS. — Collection of not less than six double varieties:	
First, Dr. C. G. Weld	5 00
Display of thirty bottles, Single and Anemone Flowered:	
First, Dr. C. G. Weld	3 00
Second, Rea Brothers	2 00

ORIENTAL POPPIES. — Display:

First, Harry Seaton Rand	3 00
Second, Walter J. Clemson	2 00
Third, Dr. C. G. Weld	1 00

AQUILEGIAS. — Collection, twenty-five vases:

Second, William C. Winter	2 00
Third, W. A. Jeffries	1 00

VASE OF FLOWERS:

First, Mrs. E. M. Gill	4 00
Second, Miss Hattie B. Winter	3 00

Gratuities: —

H. H. Hunnewell, Named Rhododendrons	30 00
Mrs. B. P. Cheney, Sr., Collection of Rhododendrons	20 00
Mrs. John L. Gardner, Rhododendrons	7 00
Dr. C. G. Weld, "	5 00
William H. Spooner, Collection of Roses	1 00
M. A. Patten, Two Vases of Carnations	8 00
James Comley, *Lilium longiflorum*	3 00
Blue Hill Nursery, Hardy Perennials	3 00
Rea Brothers, " "	2 00
Walter J. Clemson, Collection	6 00
T. C. Thurlow, "	3 00
Mrs. E. M. Gill, Display	3 00
Charles W. Parker, "	1 00

PÆONY EXHIBITION.

JUNE 16.

HERBACEOUS PÆONIES. — Collection of named varieties, double:

First, Dr. C. G. Weld	12 00
Second, Mrs. John L. Gardner	10 00
Third, George Hollis	8 00

Collection of named varieties, single:

First, Mrs. John L. Gardner	6 00
Third, George Hollis	4 00

Vase of blooms on long stems, arranged for effect in the Society's large China vases:

First, Dr. C. G. Weld	10 00
Second, Mrs. John L. Gardner	8 00
Third, George Hollis	6 00
Fourth, W. J. Clemson	4 00

FOXGLOVES. — Twelve spikes:

Second, W. J. Clemson	2 00

Gratuities: —

Mrs. E. M. Gill, Vase of *Lilium umbellatum*	2 00
W. H. Spooner, Collection of Roses	1 00

Rea Brothers, Pyrethrums, etc.	4 00
Dr. C. G. Weld, Garden Pinks	2 00
W. J. Clemson, Display	3 00
Mrs. John L. Gardner, Display	2 00
Mrs. E. M. Gill, "	2 00
Blue Hill Nursery, "	2 00
R. P. Struthers, "	1 00

ROSE AND STRAWBERRY EXHIBITION.

JUNE 22 AND 23.

Special Prizes, Theodore Lyman Fund.

HARDY ROSES.—Twenty-four distinct named varieties, three of each variety:

First, Estate of Joseph S. Fay	25 00
Second, Estate of Joseph S. Fay	20 00

Society's Prizes.

Sixteen named varieties, three of each variety:	
First, Estate of Joseph S. Fay	15 00
Twelve named varieties, three of each:	
First, Dr. C. G. Weld	10 00
Second, Estate of Joseph S. Fay	8 00
Six named varieties, three of each:	
First, Estate of Joseph S. Fay	6 00
Second, Mrs. O. S. Paige	4 00
Three named varieties, three of each:	
First, Estate of Joseph S. Fay	3 00
Second, Dr. C. G. Weld	2 00
Third, Mrs. R. M. Clark	1 00
Twenty-four named varieties, one of each:	
First, Mrs. R. M. Clark	10 00
Second, Estate of Joseph S. Fay	8 00
Third, Mrs. John L. Gardner	6 00
Eighteen named varieties, one of each:	
First, Mrs. O. S. Paige	8 00
Second, Estate of Joseph S. Fay	6 00
Twelve named varieties, one of each:	
First, Dr. C. G. Weld	6 00
Second, Estate of Joseph S. Fay	4 00
Third, Mrs. R. M. Clark	2 00
Six named varieties, one of each:	
First, Estate of Joseph S. Fay	4 00
Second, Dr. C. G. Weld	3 00

Twenty-four blooms of Madame Gabriel Luizet:
First, Estate of Joseph S. Fay 8 00
Second, Dr. C. G. Weld 6 00
Third, Mrs. O. S. Paige 4 00
Six blooms of John Hopper:
First, Dr. C. G. Weld 3 00
Second, Mrs. O. S. Paige 2 00
Six blooms of Jubilee:
First, Estate of Joseph S. Fay 3 00
Six blooms of Merveille de Lyon:
First, Dr. C. G. Weld 3 00
Twelve of any other variety:
First, Estate of Joseph S. Fay 4 00
Second, Estate of Joseph S. Fay 3 00
Third, Estate of Joseph S. Fay 2 00
Best single bloom of any variety:
First, Estate of Joseph S. Fay 2 00

Moss Roses. — Six named varieties, three clusters of each:
First, Mrs. John L. Gardner 3 00
Second, Mrs. E. A. Wilkie 2 00

Hybrid Tea Roses. — Six named varieties, buds admissible:
First, Estate of Joseph S. Fay 3 00

General Display. — One hundred bottles of Hardy Roses, buds admissible:
First, Francis Blake 10 00
Second Dr. C. G. Weld 9 00
Third, Mrs. O. S. Paige 8 00
Fourth, W. J. Clemson 7 00
Fifth, Mrs. E. M. Gill 6 00
Sixth, Miss E. J. Clark, Pomfret, Conn. 5 00

Basket of Roses. — Arranged for effect:
First, Mrs. E. M. Gill 5 00

Sweet Williams. — Thirty spikes, not less than six varieties:
First, W. J. Clemson 4 00
Second, Anthony McLaren 3 00
Third, Mrs. John L. Gardner 2 00
Fourth, E. C. Lewis 1 00
Display, eighteen vases of three trusses each:
First, W. J. Clemson 4 00
Second, E. C. Lewis 3 00
Third, Blue Hill Nursery 2 00
Fourth, William C. Winter 1 00

Spanish Irises. — Display:
First, Rea Brothers 3 00
Second, W. J. Clemson 2 00

Vase of Flowers. — Best arranged:
First, Mrs. E. M. Gill 5 00
Second, Miss Hattie B. Winter 4 00

Gratuities:—

Estate of Joseph S. Fay, Display of Rose Madame Gabriel de Luizet	4 00
M. H. Walsh, Display of Rose Joseph S. Fay	3 00
William H. Spooner, Collection of Single and Semi-double Roses	2 00
Miss E. J. Clark, Display of Roses	8 00
Mrs. E. M. Gill, " " "	8 00
W. J. Clemson, Vase of Phlox Miss Lingard	1 00
Charles H. Wheeler, Pæony Norfolk	2 00
George Hollis, Display of Pæonies	2 00
T. C. Thurlow, Pæonies, etc.	4 00
T. C. Thurlow, Pæonies and Hardy Shrubs	2 00
Blue Hill Nursery, Display of Perennials	5 00
Carl Blomberg, " " "	2 00
Rea Brothers, Display of Perennials, etc.	3 00
Estate of Joseph S. Fay, Display	8 00
Estate of Joseph S. Fay, "	6 00
Dr. C. G. Weld, "	5 00
Mrs. R. M. Clark, "	2 00
Francis Blake, "	1 00
Mrs. D. Chadwick, "	1 00
I. E. Coburn, "	1 00
Jackson Dawson, "	1 00
Mrs. E. A. Wilkie, "	1 00

JUNE 30.

HARDY ROSES:—Collection, named, not less than twenty-five varieties, filling fifty vases, one rose in each vase:	
First, Estate of Joseph S. Fay	15 00
Second, Estate of Joseph S. Fay	10 00
Third, Estate of Joseph S. Fay	6 00
IRIS KÆMPFERI.—Fifteen varieties, three of each, in vases:	
First, Mrs. John L. Gardner	6 00
Six varieties, three of each:	
First, Dr. C. G. Weld	4 00
CAMPANULA MEDIUM.—Collection, not less than fifteen bottles:	
Second, Mrs. John L. Gardner	4 00
SWEET WILLIAMS.—Auricula flowered, thirty spikes of not less than six distinct varieties:	
First, Mrs. John L. Gardner	3 00
Second, W. J. Clemson	2 00
DELPHINIUMS.—Collection of twenty spikes, not less than five varieties:	
First, Mrs. John L. Gardner	5 00
Second, Miss M. S. Walker	4 00
Third, Rea Brothers	3 00

Display, thirty vases of three spikes each:

First, Mrs. John L. Gardner	6 00
Second, Rea Brothers	5 00

HARDY HERBACEOUS PLANTS. — Thirty bottles:

First, Blue Hill Nursery	6 00
Second, Rea Brothers	5 00
Third, W. J. Clemson	4 00

VASE OF FLOWERS:

First, Mrs. E. M. Gill	4 00
Second, Miss Hattie B. Winter	3 00

Gratuities: —

William H. Spooner, Crimson Rambler Roses	1 00
Estate of Joseph S. Fay, Roses	8 00
Mrs. B. P. Cheney, "	8 00
Charles W. Parker, "	1 00
Mrs. E. A. Wilkie, Roses and Sweet Williams	2 00
Mrs. E. M. Gill, Roses and General Display	4 00
W. J. Clemson, Sweet Williams	1 00
E. C. Lewis, Sweet Williams and Sweet Peas	2 00
James Comley, *Lilium longiflorum*	5 00
W. J. Clemson, General Display	3 00

JULY 7.

HOLLYHOCKS. — Double, six blooms, of six colors, in flat dishes:

Second, E. C. Lewis	2 00

Double, twelve spikes:

Second, E. C. Lewis	4 00

Single, twelve spikes:

Second, E. C. Lewis	3 00

SHIRLEY POPPIES. — Display:

First, E. C. Lewis	3 00

PERENNIAL PHLOXES. — Suffruticosa or early blooming section, collection of named varieties:

First, Rea Brothers	3 00

VASE OF FLOWERS. — Best arranged:

First, Miss Hattie B. Winter	4 00
Second, Mrs. E. M. Gill	3 00

Gratuities: —

Estate of Joseph S. Fay, Display of Roses	6 00
W. J. Clemson, Japanese Irises	3 00
E. C. Lewis, Sweet Peas	1 00
Rea Brothers, Hardy Perennials	5 00
Blue Hill Nursery, " "	5 00
W. J. Clemson, Display	4 00
Mrs. J. B. Lawrence, "	1 00

JULY 14.

TUBEROUS BEGONIAS.—Collection, arranged with their own foliage, in flat dishes:

First, E. S. Converse	4 00
Second, E. S Converse	3 00
Third, H. Dumaresq	2 00

HARDY AQUATIC FLOWERS.—Collection, named:

First, Mrs. John L. Gardner	8 00

Gratuities:—

E. C. Lewis, Hollyhocks	3 00
Joseph S. Chase, "	1 00
W. J. Clemson, Vase of Allamanda	1 00
Mrs. J. B. Lawrence, Sweet Peas	2 00
W. J. Clemson, Display of Japanese Irises	2 00
M. H. Walsh, Display of Roses	2 00
Mrs. A. A. Johnson, Daisies	2 00
Blue Hill Nursery, Perennials	4 00
Rea Brothers, "	3 00
Estate of Joseph S. Fay, General Display	5 00
W. J. Clemson, Display	2 00
E. C. Lewis, "	2 00
Mrs. E. M. Gill, "	1 00

JULY 21.

SWEET PEAS.—Display of named varieties, filling thirty vases, arranged with their own foliage:

First, H. B. Watts	6 00
Second, J. Henry Fletcher	4 00
Third, Mrs. H. A. Jones	3 00

Display of named varieties in vases, six sprays in each vase:

First, H. B. Watts	4 00
Second, Mrs. H. A. Jones	3 00
Third, J. Henry Fletcher	2 00

HARDY HERBACEOUS PLANTS.—Thirty bottles:

First, Blue Hill Nursery	6 00
Second, W. J. Clemson	5 00
Third, Rea Brothers	4 00

VASE OF FLOWERS.—For table decoration:

First, Mrs. E. M. Gill	4 00
Second, Miss Hattie B. Winter	3 00

Gratuities:—

Theodore F. Dwight, Sweet Peas	1 00
Mrs. J. B. Lawrence, " "	1 00
W. J. Clemson, Allamanda and Sweet Peas	1 00
Mrs. J. B. Lawrence, Nasturtiums	1 00

E. C. Lewis, Hollyhocks 1 00
Mrs. E. A. Wilkie, Display 2 00
E. C. Lewis, " 1 00

JULY 28.

PERENNIAL PHLOXES.—Twelve named varieties, one truss of each:

First, Rea Brothers 3 00
Second, W. J. Clemson 2 00

Gratuities:—

W. J. Clemson, Vase of Tritomas 1 00
Blue Hill Nursery, Perennials 4 00
Mrs. J. B. Lawrence, Display 2 00
W. J. Clemson, " 2 00
Mrs. E. M. Gill, " 2 00
Mrs. G. Duncan, " 1 00

AUGUST 4.

ANNUALS.—General display, named, not less than fifty varieties, filling not less than one hundred and fifty bottles:

First, Mrs. John L. Gardner 10 00
Second, Mrs. E. M. Gill 8 00
Third, E. C. Lewis 6 00

Gratuities:—

Rea Brothers, Collection of Phloxes 3 00
W. J. Clemson, Phloxes and Sweet Peas 2 00
Blue Hill Nursery, Vase of *Lilium Batemanniæ* 1 00
W. J. Clemson, *Lilium auratum*, Tritoma, and Allamanda . . 3 00
Mrs. C. A. Jones, Collection of Annuals 3 00
Blue Hill Nursery, Herbaceous Plants 2 00
E. A. Weeks, Display 2 00

AUGUST 11.

PERENNIAL PHLOXES.—Eighteen vases of eighteen named varieties:

First, George Hollis 5 00
Second, T. C. Thurlow 4 00
Third, Rea Brothers 3 00

Gratuities:—

H. A. Wheeler, Orchids 2 00
J. Warren Clark, Gladioli 2 00
E. J. Shaylor, " 1 00
Norris F. Comley, Asters 2 00
F. O. Willard, " 1 00

Rea Brothers, Delphiniums	1 00
Blue Hill Nursery, Display of Herbaceous Plants	2 00
W. J. Clemson, Display	1 00
Mrs. G. Duncan, "	1 00
Mrs. E. M. Gill, "	1 00
E. C. Lewis, "	1 00
R. P. Struthers, "	1 00

EXHIBITION OF AQUATIC PLANTS, ETC.

AUGUST 19.

Theodore Lyman Fund.

AQUATICS.—General display of Nymphæas, Nelumbiums, Sedges, Papyrus and other acquatic plants, arranged for effect, to include not less than twenty-five blooms of Nymphæas:	
First, Oakes Ames	20 00
GLADIOLI.—Twenty named varieties, in spikes:	
First, J. Warren Clark	4 00
Second, E. J. Shaylor	3 00
Ten named varieties:	
First, J. Warren Clark	3 00
Second, E. J. Shaylor	2 00
Third, Mrs. John L. Gardner	1 00
Six named varieties:	
First, J. Warren Clark	2 00
Second, Paul R. Blackmer	1 00
Display of named and unnamed varieties, filling one hundred vases, arranged for effect, with any foliage:	
First, J. Warren Clark	8 00
Second, E. J. Shaylor	6 00
ASTERS.—Large Flowered, of all classes, fifty vases, not less than twelve varieties, three flowers in each vase:	
First, Mrs. John L. Gardner	6 00
Second, Norris F. Comley	5 00
Truffaut's Pæony Flowered, thirty blooms not less than twelve varieties:	
Second, E. S Converse	3 00
Victoria Flowered, thirty blooms, not less than twelve varieties:	
First, Mrs John L. Gardner	4 00
Second, Mrs. John L. Gardner	3 00
Third, Norris F. Comley	2 00
HARDY HERBACEOUS PLANTS.—Thirty bottles:	
First, Blue Hill Nursery	6 00
Third, Blue Hill Nursery	4 00

Gratuities:—

John Lewis Childs, Floral Park, N. Y., Gladioli	4 00
Norris F. Comley, Asters	1 00
George Hollis, Display of Phloxes	3 00
W. C. Winter, Dahlias	2 00
Rea Brothers, Display	5 00
Mrs. E. M. Gill, "	3 00
James Comley, "	1 00
Mrs. E. A. Wilkie, Exhibit	2 00

AUGUST 25.

Gratuities:—

Lothrop & Higgins, Dahlias	5 00
Charles S. Pratt, "	2 00
J. Warren Clark, Gladioli	3 00
William A. Green, Asters	1 00

SEPTEMBER 1.

Gratuities:—

Lothrop & Higgins, Dahlias	5 00
C. S. Pratt, "	4 00
Mrs. J. B. Lawrence, "	3 00
Mrs. E. M. Gill, Display	2 00

ANNUAL EXHIBITION OF PLANTS AND FLOWERS.

SEPTEMBER 5 AND 6.

DAHLIAS.—Show, eighteen blooms, named varieties:	
First, William C. Winter	4 00
Second, Lothrop & Higgins	3 00
Fancy, eighteen blooms, named varieties:	
First, H. F. Burt	4 00
Second, Lothrop & Higgins	3 00
Cactus, twelve blooms, named varieties:	
First, H. F. Burt	4 00
Second, H. F. Burt	3 00
Third, William G. Winsor	2 00
Decorative, twelve blooms, named varieties:	
First, William G. Winsor	4 00
Second, H. F. Burt	3 00
Third, Lothrop & Higgins	2 00
Show, six blooms, named varieties:	
First, H. F. Burt	2 00
Second, William G. Winsor	1 00
Fancy, six varieties:	
First, H. F. Burt	2 00
Second, H. F. Burt	1 00

Best single bloom, of any class, introduction of 1898 or later:
First, H. F. Burt 1 00
Pompon, twelve vases of three blooms each, named varieties:
First, William C. Winter 3 00
Second, William H. Symonds 2 00
Third, Lothrop & Higgins 1 00
Single, twelve vases of three blooms each, named varieties:
First, William C. Winter 2 00
General Display, all classes admissible, one hundred or more bottles:
First, William C. Winter 12 00
Second, Lothrop & Higgins 10 00
Third, C. S. Pratt 8 00
Fourth, Mrs. J. B. Lawrence 6 00
Fifth, William H. Symonds 4 00
TROPÆOLUMS. — Display with their own foliage, filling twenty-five vases, not over eighteen blooms of one variety in each:
First, J. A. Cain 3 00
Second, E. C. Lewis 2 00
MARIGOLDS. — Display of French and African, filling twenty-five vases:
First, E. C. Lewis 3 00
Second, Mrs. A. F. Pero 2 00
DOUBLE ZINNIAS. — Fifty flowers, not less than twelve varieties:
Second, E. C. Lewis 2 00
Third, Norris F. Comley 1 00
POMPON ZINNIAS. — Fifty flowers, not less than twelve varieties:
First, A. B. Howard 3 00
Third, W. A. Jeffries 1 00
DIANTHUSES. — Collection of Annual and Biennial varieties, filling thirty bottles:
First, Mrs. J. B. Lawrence 3 00
Second, E. C. Lewis 2 00
VASE OF FLOWERS. — For table decoration, on the last day of the exhibition:
First, Miss Hattie B. Winter 4 00
Second, Mrs. E. M. Gill 3 00

Gratuities: —

Blue Hill Nursery, *Lilium speciosum* 2 00
James Comley, Display of Asters 5 00
Rea Brothers, Phlox 3 00
J. Warren Clark, Gladioli 3 00
A. B. Howard & Son, Petunias and Verbenas 2 00
Blue Hill Nursery, Display 6 00
W. J. Clemson, " 2 00
Mrs. E. M. Gill, " 2 00
Schlegel & Fottler, " 2 00

SEPTEMBER 8.

Gratuity:—

C. S. Pratt, Dahlias 2 00

SEPTEMBER 15.

DAHLIAS. — Cactus, twelve blooms, named varieties:

First, H. F. Burt	3 00
Second, H. F. Burt	2 00
Third, W. G. Winsor	1 00

PERENNIAL ASTERS. — Collection of Native or Introduced species and varieties:

First, Misses Eleanor A. and Mollie S. Doran	5 00
Second, Blue Hill Nursery	4 00
Third, Miss Alice L. Grinnell	3 00

HARDY HERBACEOUS PLANTS. — Thirty bottles;

First, Blue Hill Nursery	6 00
Second, Carl Blomberg	5 00
Third, W. J. Clemson	4 00

Gratuities:—

William G. Winsor, Dahlias	2 00
William C. Winter, "	2 00
H. F. Burt, "	2 00
James Comley, Asters	1 00
Rea Brothers, Phlox	2 00
Rea Brothers, *Delphinium formosum*	1 00
W. J. Clemson, Allamanda	1 00
Francis Skinner, Jr., Display	2 00

SEPTEMBER 22.

Gratuity:—

C. S. Pratt, Display of Dahlias 2 00

SEPTEMBER 27 AND 28.

Gratuities:—

F. A. Blake, Geraniums, named varieties	3 00
H. F. Burt, Dahlias	3 00
E. C. Lewis, Display	2 00

OCTOBER 20.

Gratuities:—

Mrs. E. M. Gill, Chrysanthemums	1 00
James Comley, "	1 00

OCTOBER 27.

Gratuity:—

Mrs. E. M. Gill, Display 1 00

CHRYSANTHEMUM SHOW.

NOVEMBER 6, 7, 8, AND 9.

Josiah Bradlee Fund.

CHRYSANTHEMUMS.— Twenty-five blooms of twenty-five distinct varieties, named:

First, Mrs. B. P. Cheney	18 00
Second, Miss E. J. Clark, Pomfret, Conn.	12 00
Third, Col. Charles Pfaff	8 00
Six vases of six named varieties, ten blooms each:	
First, Mrs. A. W. Spencer	30 00
Second, Mrs. B. P. Cheney	25 00
Third, Norris F. Comley	20 00

Henry A. Gane Memorial Fund.

For the best twelve specimen blooms of any of the Seedling Chrysanthemums, originated by the late Henry A. Gane:

First, Charles D. Sias	20 00
Second, Mrs. A. W. Spencer	10 00

Society's Prizes.

Twelve blooms, Incurved, named, in vases:	
Second, Dr. C. G. Weld	6 00
Third, E. S. Converse	4 00
Twelve blooms, Japanese, named, in vases:	
First, Mrs. B. P. Cheney	10 00
Twelve blooms, Japanese Incurved, named:	
First, Mrs. B. P. Cheney	10 00
Second, Joseph H. White	6 00
Third, Col. Charles Pfaff	4 00
Twelve blooms, Anemone, named:	
First, Dr. C. G. Weld	8 00
Third, E. S. Converse	4 00
Six blooms, Incurved, named:	
First, E. S. Converse	5 00
Second, Dr. C. G. Weld	4 00
Six blooms, Japanese, named:	
First, Joseph H. White	6 00
Six blooms, Japanese Incurved, named:	
First, H. Dumaresq	6 00
Second, Mrs. G. W. Knowlton	4 00
Third, Col. Charles Pfaff	2 00
Six blooms Reflexed, named, in vases:	
First, Joseph H. White	6 00
Second, Mrs. B. P. Cheney	4 00
Third, Col. Charles Pfaff	2 00

Six blooms, Anemone, named, in vases:	
First, E. S. Converse	5 00
Second, W. A. Jeffries	4 00
Best six varieties, named, introductions of the current year:	
First, H. Dumaresq	6 00
Vase of ten blooms on long stems, Pink, named:	
First, Robert Laurie, Newport, R. I.	10 00
Second, Mrs. B. P. Cheney	8 00
Third, Mrs. A. W. Spencer	6 00
Vase of ten blooms on long stems, Red, named:	
First, Miss E. J. Clark	10 00
Second, Mrs. A. W. Spencer	8 00
Third, Charles D. Sias	6 00
Vase of ten blooms on long stems, White, named:	
First, Mrs. A. W. Spencer	10 00
Second, Robert Laurie	8 00
Third, Miss E. J. Clark	6 00
Vase of ten blooms on long stems, Yellow, named:	
First, Mrs. A. W. Spencer	10 00
Second, Robert Laurie	8 00
Third, Col. Charles Pfaff	6 00
Vase of ten blooms, on long stems, any other color, named:	
First, Miss E. J. Clark	10 00
Second, Mrs. B. P. Cheney	8 00
Third, Mrs. A. W. Spencer	6 00
Vase of blooms on long stems, arranged in the Society's large China vases: prizes to be repeated every day during the exhibition:	
First, Estate of John Simpkins	10 00
Second, Col. Charles Pfaff	9 00
Third, Mrs. A. W. Spencer	8 00
Fourth, Miss E. J. Clark	7 00
Best Seedling, Red, never disseminated, six blooms:	
John N. May, for Brutus	5 00
Best Seedling, White, never disseminated, six blooms:	
J. W. Frasier, for Dr. J. A. Frasier	5 00
Best Seedling, any other color, never disseminated, six blooms:	
John N. May, for Yanariva	5 00

Gratuities:—

Miss E. J. Clark, Vase of Chrysanthemum Mrs. Bown	6 00
H. H. Rogers, Chrysanthemums	3 00
John Thomas, "	3 00
E. S. Converse, "	2 00
J. W. Howard, Vases of Roses	1 00
Dailledouze Brothers, Flatbush, N. Y., Carnation Prosperity	1 00
M. A. Patten, Carnations	10 00

Albert Roper, Display of Carnations	5 00
I. E. Coburn, Pansies	2 00
Blue Hill Nursery, Hardy Flowers	2 00
Mrs. E. M. Gill, Display	3 00
James Comley, "	1 00

AWARDS OF NOVEMBER 7.

CHRYSANTHEMUMS.—Vase of blooms, on long stems, arranged in the Society's large China vases:

First, Col. Charles Pfaff	10 00
Second, Mrs. A. W. Spencer	9 00
Third, Miss E. J. Clark	8 00
Fourth, Estate of John Simpkins	7 00

ROSES.—Vase of twenty-five blooms, assorted varieties:

First, J. W. Howard	5 00

Gratuities:—

Mrs. A. W. Spencer, Vase of Chrysanthemum Major Bonnafon	3 00
William Sim, Vase of Violets	1 00
James Comley, Vase of Chrysanthemums	5 00
Norris F. Comley, " " "	5 00

AWARDS of NOVEMBER 8.

CHRYSANTHEMUMS.—Vase of blooms, on long stems, arranged in the Society's large China vases:

First, Col. Charles Pfaff	10 00
Second, Miss E. J. Clark	9 00
Third, Mrs. A. W. Spencer	8 00
Fourth, Estate of John Simpkins	7 00

VIOLETS.—Single, collection of varieties, fifty blooms each:

First, Norris F. Comley	5 00
Second, William Sim	4 00

Double, collection of varieties, fifty blooms each:

First, Mrs. A. W. Spencer	5 00
Second, Norris F. Comley	4 00

AWARDS OF NOVEMBER 9.

CHRYSANTHEMUMS.—Vase of blooms, on long stems, arranged in the Society's large China vases:

First, Col. Charles Pfaff	10 00
Second, Estate of John Simpkins	9 00
Third, Miss E. J. Clark	8 00
Fourth, Mrs. A. W. Spencer	7 00

SOCIETY'S SILVER MEDALS.

April 5. David Monteith, for Carnation Beulah.

May 5. The Floral Exchange, Inc., Philadelphia, Pa., for New Rose Queen of Edgely.

Rose Exhibition, June 22 and 23. Jackson Dawson, for Rose Lady Duncan.

July 7. Michael H. Walsh, for Rose Sweetheart, *Rosa Wichuraiana* × Bridesmaid.

Chrysanthemum Show, November 6–9. Col. Charles Pfaff for largest number of first prizes for Vase of Chrysanthemums.

SOCIETY'S BRONZE MEDALS.

Chrysanthemum Show, November 6-9. Robert Montgomery, for Rose Mrs. Oliver Ames.

" " " " Estate of John Simpkins, for largest number of second prizes for Vase of Chrysanthemums.

KELWAY SILVER GILT MEDAL.

June 16. Kenneth Finlayson, for *Pæonia albiflora.*

FIRST CLASS CERTIFICATES OF MERIT.

March 10. C. W. Ward, Queens, N. Y., for Carnation G. H. Crane.

" " C. W. Ward, for Carnation Governor Roosevelt.

March 31. Hicks Arnold, for *Lælia Jongheana.*

April 7. Thomas J. Grey & Co., for Grey's Mammoth White Column Stock.

May 19. William Sim, for Candytuft Sim's Improved.

" 26. R. & J. Farquhar & Co., for *Begonia semperflorens*, new named varieties.

Rhododendron Exhibition, June 12 and 13. H. H. Hunnewell, *Viburnum macrocephalum.*

Rose Exhibition, June 22 and 23. Rea Brothers, for *Campanula persicæfolia grandiflora.*

" " " " " " W. A. Manda, South Orange, N. J., for Rose Pink Pearl.

July 14. Dr. C. G. Weld, for *Gerbera Jamesonii.*

" 21. Oakes Ames, for Nymphæa × Diana.

August 4. Henry T. Clinkaberry, Trenton, N. J., for *Cypripedium Clinkaberryanum, C. Curtisii* × *C. Philippinensis.*

HONORABLE MENTION.

February 24. David Monteith, for Carnation Beulah.

March 10. Dailledouze Brothers, Flatbush, N. Y., for Carnation No. 666.

" 31. Alfred J. Lovelace, for Antirrhinum Wyndhurst.

" " Hicks Arnold, for *Dendrobium atro-violaceum.*

May 5. D. Carmichael, for Carnation Eleanor Ames.

" 19. Dr. C. G. Weld, for *Morphixia longiflora.*

Rose Exhibition, June 22 and 23. W. A. Manda, for Rose Improved Pink Roamer, Jersey Beauty × Bardou Job.

August 11. Hon. Charles W. Hoitt, Nashua, N. H., for *Lilium Henryi.*

" 18. J. Lewis Childs, Floral Park, N. Y., for *Tritoma Pfitzeri.*

REPORT

OF THE

COMMITTEE ON FRUITS

FOR THE YEAR 1900.

By E. W. WOOD, CHAIRMAN.

The past season has shown the usual variation in the production of the different kinds of fruit grown in the state. In all localities the set of apples was unusually full. The excess in quantity of fruit and the drought during the summer retarded their growth, but the gale in September reduced the quantity of most varieties, in many places at least one half. The Baldwins were less reduced than most other varieties. This process of thinning the fruit was unevenly distributed over the trees, being mostly from the windward side, but it relieved the overburdened trees, and the fruit remaining attained larger size and better quality. The unusual crop and the difficulty of furnishing barrels induced some growers to accept first offers and they sold at low rates, delivered loose in the cars, but the large amount recently exported and the demand from western markets have prevented any surplus and at the present time well packed fruit is bringing satisfactory prices.

Pears shown at the exhibitions have not been equal to the average of past years in size or quantity. About the usual quantity of the earlier varieties were shown but the gale blew many of the best specimens of the later varieties from the trees. The Anjou pear seems to be losing its former high reputation as a commercial fruit. While with some growers it apparently sustains its

former standard, in many places the past few years and especially the past season it has been so badly spotted as to be almost worthless.

Peaches have been shown in larger quantities than usual. The Elberta was shown by several growers. It is of large size, good quality, and exceptionally good color. This variety is largely grown in the Southern States; if it proves as hardy here as other varieties it will be a valuable acquisition.

Plums continue to increase in quantity and in the number of varieties, the increase being due to the more general cultivation of the Japanese varieties. Of these recent additions most of those shown were of good size and quality.

Cherries have been almost a complete failure; there was an unusually full bloom, but a freeze killed the fruit germs and only in exceptionally favorable locations was there any fruit.

Grapes have been shown in more than the usual quantity and of excellent quality; the warm, dry weather late in the season was favorable for their full maturity.

The exhibition of small fruits has been fully up to the average of past years.

The exhibitions through the season compared favorably with those of previous years. At the Strawberry Exhibition the Marshall sustained its former reputation as an exhibition variety, and where grown on a strong soil under high cultivation and the vines properly thinned, it proved a profitable market variety. At the Saturday exhibition the following week there were shown two seedling varieties that are very promising for late kinds. With the exception of these two seedling strawberries there were no new fruits shown deserving special mention.

The appropriation for Fruits was seventeen hundred and thirty-two dollars; there have been awarded in prizes and gratuities fifteen hundred and eighty-nine dollars, leaving an unexpended balance of one hundred and forty-three dollars.

For the Committee,

E. W. WOOD, *Chairman.*

PRIZES AND GRATUITIES AWARDED FOR FRUITS.

1900.

SPRING EXHIBITION.

March 20, 21, 22, and 23.

Winter Apples. — Baldwin:	
First, C. F. Boyden	3 00
Second, A. E. Hartshorn	2 00
Third, E. M. Bruce	1 00
Northern Spy:	
First, C. F. Boyden	3 00
Roxbury Russet:	
First, Miss E. J. Cutter	3 00
Second, C. F. Boyden	2 00
Third, A. E. Hartshorn	1 00
Tompkins King:	
First, George C. Rice	3 00
Any other variety:	
First, A. E. Hartshorn, Sutton	3 00
Second, George V. Fletcher, Rhode Island Greening	2 00
Third, Mrs. A. E. Underwood, " " "	1 00
Winter Pears. — Any variety:	
First, George V. Fletcher, Anjou	3 00
Second, George V. Fletcher, Dana's Hovey	2 00
Strawberries. — One pint:	
First, Francis Blake, Marshall	3 00
Gratuity: —	
John L. Bird, Oranges	1 00

April 7.

Gratuity: —	
William C. Winter, Peaches	1 00

June 16.

Gratuity: —	
William C. Winter, Grapes and Peaches	2 00

ROSE AND STRAWBERRY EXHIBITION.

JUNE 22 AND 23.

Special Prizes from the Theodore Lyman Fund.

STRAWBERRIES. — Four quarts of any variety:

First, Warren Heustis & Son, Marshall	20 00
Second, Sumner Coolidge, "	16 00
Third, Warren Heustis & Son, Bubach	12 00
Fourth, George V. Fletcher, Marshall	10 00

Special Prizes offered by the Society.

Two quarts of any variety best adapted for garden cultivation for home use to be judged by points:

First, I. E. Coburn, Marshall	6 00
Second, Warren Heustis & Son, Marshall	5 00
Third, Warren Heustis & Son, Nick Ohmer	4 00
Fourth, George McWilliam, Seedling	3 00

Regular Prizes.

For the largest and best collection, not less than fifteen baskets of two quarts each, and not less than five varieties:

Second, George F. Wheeler	15 00

Ten baskets, two quarts each, not less than three varieties:

First, Warren Heustis & Son	15 00
Second, George V. Fletcher	12 00
Third, George F. Wheeler	10 00

Five baskets, one variety, two quarts each:

First, Warren Heustis & Son	8 00
Second, George F. Wheeler, Sample	6 00
Third, George F. Wheeler, Seedling	5 00

Two quarts of Belmont:

First, Warren Heustis & Son	4 00
Second, George V. Fletcher	3 00

Brandywine:

Third, George F. Wheeler	2 00

Bubach:

First, George V. Fletcher	4 00
Second, I. E. Coburn	3 00
Third, Warren Heustis & Son	2 00

Charles Downing:

Second, Miss M. S. Walker	3 00

Clyde:

First, I. E. Coburn	4 00
Third, George F. Wheeler	2 00

Crescent:

Second, I. E. Coburn	3 00

Enormous:
First, George V. Fletcher 4 00
Haverland:
First, I. E. Coburn 4 00
Second, George F. Wheeler 3 00
Third, Miss E. J. Clark 2 00
Jessie:
First, George V. Fletcher 4 00
Margaret:
First, B. M. Smith 4 00
Second, George F. Wheeler 3 00
Marshall:
First, Warren Heustis & Son 4 00
Second, Herbert Dumaresq 3 00
Third, George V. Fletcher 2 00
Miner's Prolific:
Second, George F. Wheeler 3 00
Any other variety:
First, I. E. Coburn, Sample 4 00
Second, I. E. Coburn, Nick Ohmer 3 00
Third, George F. Wheeler, Sample 2 00
Collection, not less than six varieties, one quart of each:
First, George V. Fletcher 8 00
Second, George F. Wheeler 6 00
One quart of any new variety not previously exhibited:
First, S. H. Warren, Seedling 5 00
FOREIGN GRAPES.—Two bunches of any variety:
First, Miss E. J. Clark, Pomfret, Conn., Black Hamburg . 6 00
Second, E. S. Converse, White Sweetwater 4 00
FORCED PEACHES.—Six specimens of any variety:
First, Miss E. J. Clark, Hale's Early 3 00
Second, Miss M. S. Walker, " " 2 00

JUNE 30.

STRAWBERRIES.—Two quarts of any variety:
First, Warren Heustis & Son, Marshall 4 00
Second, William H. Monroe, Seedling 3 00
Third, George V. Fletcher, Marshall 2 00
CHERRIES.—Two quarts of Black Tartarian:
First, James L. Duncan 3 00
Second, George V. Fletcher 2 00
Coe's Transparent:
First, John L. Bird 3 00
Downer:
First, M. W. Chadbourne 3 00
Any other variety:
First, J. H. Fletcher, Napoleon 3 00
Second, Miss Vera Chapelle, Napoleon 2 00

Gratuity:—

E. O. Orpet, Nectarines 2 00

JULY 7.

CURRANTS.—Two quarts of any Red variety:

First, W. J. Clemson, Versaillaise 4 00
Second, W. J. Clemson, Fay's 3 00
Third, W. J. Clemson 2 00
Fourth, William C. Winter, Fay's 1 00

Two quarts of any White variety:

First, W. J. Clemson, White Grape 3 00
Second, Joseph S. Chase, " " 2 00
Third, William C. Winter, " " 1 00

GOOSEBERRIES.—Two quarts of any variety of American origin:

First, J. S. Chase, Triumph 4 00
Second, W. J. Clemson, Columbia 3 00
Third, G. L. Brown, Triumph 2 00
Fourth, W. J. Clemson, " 1 00

Gratuities:—

W. H. Monroe, Seedling Strawberries 2 00
Warren Heustis & Son, Marshall Strawberries 1 00
Miss Vera Chapelle, Cherries 1 00
M. W. Chadbourne, Cherries and Currants 1 00

JULY 14.

RASPBERRIES.—Two quarts of any variety:

First, E. S. Converse, Columbia 3 00

CURRANTS.—One quart of any Red variety:

First, W. J. Clemson, Versaillaise 3 00
Second, W. J. Clemson, Fay's 2 00
Third, Mrs. E. M. Gill, Versaillaise 1 00

One quart of any White variety:

First, W. A. Jeffries, White Grape 2 00
Second, W. J. Clemson, " " 1 00

GOOSEBERRIES.—Two quarts of any Foreign variety:

First, W. J. Clemson, Whitesmith 4 00
Second, W. J. Clemson, Industry 3 00
Third, Dr. W. G. Kendall, " 2 00
Fourth, William O'Connell, " 1 00

Gratuities:—

E. O. Orpet, Nectarines 1 00
W. J. Clemson, Collection 2 00

JULY 21.

BLACKBERRIES.—Two quarts of any variety:

First, M. W. Chadbourne 3 00

APPLES. — Tetofsky:

First, Varnum Frost	3 00
Second, William C. Winter	2 00
Third, David L. Fiske	1 00

PEARS. — Summer Doyenne:

First, E. S. Converse	3 00
Second, Warren Fenno	2 00
Third, L. M. Chase	1 00

PEACHES. — Six of any variety:

First, William C. Winter, Early Crawford	3 00

Gratuities: —

Mrs. E. M. Gill, Currants	1 00
W. J. Clemson, Collection	1 00

JULY 28.

APPLES. — Red Astrachan:

First, W. H. Hunt	3 00
Second, F. W. Damon	2 00
Third, John L. Bird	1 00

Sweet Bough:

First, Sumner Coolidge	3 00
Second, George V. Fletcher	2 00
Third, Warren Heustis & Son	1 00

Any other variety:

First, David L. Fiske, Early Harvest	3 00
Second, Sumner Coolidge, Oldenburg	2 00
Third, G. L. Brown, Yellow Transparent	1 00

PEARS. — Giffard:

First, A. T. Brown	3 00
Second, Warren Fenno	2 00
Third, John L. Bird	1 00

Any other variety:

First, Sumner Coolidge, Clapp's Favorite	3 00
Second, John L. Bird, Wilder	2 00
Third, Warren Fenno, Summer Doyenne	1 00

BLACKBERRIES. — Two quarts of any variety:

First, E. W. Wood	3 00
Second, E. C. Lewis	2 00
Third, Francis Blake	1 00

PEACHES. — Open culture, any variety:

First, George H. Sherwin, Hale's Early	3 00
Second, W. D. Hinds, Blush	2 00
Third, Francis Blake, Hale's Early	1 00

AUGUST 4.

APPLES. — Oldenburg:

First, Arthur F. Estabrook	3 00

Second, Mrs. H. A. Clark 2 00
Third, W. H. Hunt 1 00
Any other variety:
First, Sumner Coolidge 3 00
Second, A. E. Mayell 2 00
Third, W. H. Hunt 1 00

PEARS.—Clapp's Favorite:
First, Sumner Coolidge 3 00
Second, George V. Fletcher 2 00
Third, A. T. Brown 1 00
Any other variety:
First, A. T. Brown, Giffard 2 00
Second, Warren Fenno, " 1 00

PEACHES.—Out door culture:
First, George H. Sherwin, Hale's Early 3 00
Second, W. J. Clemson, Alexander 2 00
Third, W. D. Hinds, " 1 00
Six specimens of cold house or pot culture:
First, William C. Winter, Late Crawford 3 00

BLACKBERRIES.—Two quarts of any variety:
First, Sumner Coolidge 3 00
Second, Nathaniel T. Kidder 2 00
Third, E. W. Wood 1 00

PLUMS.—Japanese, any variety:
First, W. D. Hinds, Red June 3 00
Second, W. J. Clemson, Kelsey 2 00

FOREIGN GRAPES.—Two bunches of any variety:
First, Miss E. J. Clark, Pomfret, Conn., Black Hamburg . 5 00
Second, Miss E. J. Clark, Madresfield Court 4 00

Gratuities:—

M. W. Chadbourne, Collection 1 00
W. J. Clemson, " 1 00

AUGUST 11.

APPLES.—Chenango:
First, Sumner Coolidge 3 00
Second, Charles F. Curtis 2 00
Summer Pippin:
First, O. B. Hadwen 3 00
Second, Warren Fenno 2 00
Williams:
First, Sumner Coolidge 3 00
Second, Varnum Frost 2 00
Third, Joshua C. Stone 1 00
Any other variety:
First, W. H. Hunt, Red Astrachan 3 00

Second, George V. Fletcher, Sweet Bough	2 00
Third, David L. Fiske, Oldenburg	1 00
PEARS. — Rostiezer:	
First, E. S. Converse	3 00
Second, M. W. Chadbourne	2 00
Third, Sumner Coolidge	1 00
Tyson:	
First, John L. Bird	3 00
Second, A. T. Brown	2 00
Third, L. M. Chase	1 00
Any other variety:	
First, Sumner Coolidge, Clapp's Favorite	3 00
Second, James L. Duncan, " "	2 00
Third, A. T. Brown, " "	1 00
PEACHES. — Any variety:	
First, W. D Hinds, Alexander	3 00
Second, George H. Sherwin, Alexander	2 00
Third, Sumner Coolidge, Hale's Early	1 00
PLUMS, JAPANESE. — Abundance:	
First, E. C. Lewis	3 00
Second, W. D. Hinds	2 00
Third, David L. Fiske	1 00
Burbank:	
First, Sumner Coolidge	3 00
Second, David L. Fiske	2 00
Third, W. D. Hinds	1 00
Any other variety:	
First, E. C. Lewis, Moore's Arctic	3 00
Second, W. J. Clemson, " "	2 00
Third, W. D. Hinds, Red June	1 00
Gratuity: —	
E. J. Beswind, Italian Grapes	1 00

AUGUST 18.

APPLES. — Foundling:	
First, O. B. Hadwen	3 00
Second, C. M. Handley	2 00
Gravenstein:	
First, Warren Heustis & Son	3 00
Second, J. C. Stone	2 00
Third, W. H. Hunt	1 00
Maiden's Blush:	
First, William C. Winter	3 00
Second, J. C. Stone	2 00
Third, Warren Fenno	1 00

Porter:	
First, Sumner Coolidge	3 00
Second, C. M. Handley	2 00
Third, M. W. Chadbourne	1 00
Any other variety:	
First, J. C. Stone, Williams	3 00
Second, O. B. Hadwen, Somerset	2 00
Third, Varnum Frost, Williams	1 00
PEARS. — Andrews:	
First, E. S. Converse	3 00
Third, J. C. Stone	1 00
Bartlett:	
First, William Milman	3 00
Second, A. T. Brown	2 00
Third, Sumner Coolidge	1 00
Any other variety:	
First, Sumner Coolidge, Clapp's Favorite	3 00
Second, A. T. Brown, " "	2 00
Third, Warren Fenno " "	1 00
PEACHES. — Collection:	
First, Sumner Coolidge	4 00
Second, W. D. Hinds	3 00
Single dish of any variety:	
First, Sumner Coolidge, Early Rivers	3 00
Second, Sumner Coolidge, Alexander	2 00
Third, W. D. Hinds, Early Rivers	1 00
PLUMS. — Bradshaw:	
First, Francis Blake	3 00
Second, M. W. Chadbourne	2 00
Third, George V. Fletcher	1 00
Any other variety:	
First, E. C. Lewis, Abundance	3 00
Second, Sumner Coolidge, Burbank	2 00
Third, W. D. Hinds, Abundance	1 00
Gratuity: —	
William C. Winter, Peaches	1 00

AUGUST 25.

Gratuities: —	
C. O. Johnson, Apples	1 00
Hon. Aaron Low, Plums	1 00
J. S. Chase, Grapes	1 00

SEPTEMBER 1.

Gratuity: —	
Hon. Aaron Low, Collection of Plums	1 00

ANNUAL EXHIBITION OF PLANTS AND FLOWERS.

SEPTEMBER 5 AND 6.

Special Prizes from the Theodore Lyman Fund.

FOREIGN GRAPES. — For the heaviest and best ripened bunch of any Foreign Black Grape:

First, Miss E. J. Clark, Pomfret, Conn., Barbarossa	15 00
Second, Miss E. J. Clark, Black Alicante	10 00

Society's Prizes.

FOREIGN GRAPES. — Two bunches of Black Alicante:

First, Miss E. J. Clark	5 00
Black Hamburg:	
Second, Daniel Brown	4 00
Golden Hamburg:	
First, Daniel Brown	5 00
Lady Downes:	
First, Miss E. J. Clark	5 00
Any other variety:	
First, Miss E. J. Clark, Gros Maroc	5 00
Second, Miss E. J. Clark, Mrs. Pearson	4 00
Third, Miss E. J. Clark, Cannon Hall Muscat	3 00

Gratuities: —

Warren Fenno, Nectarines	1 00
J. S. Chase, Grapes and Peaches	2 00
Miss E. J. Cutter, Collection	3 00

SEPTEMBER 15.

APPLES. — Foundling:

First, C. M. Handley	3 00
Second, O. B. Hadwen	2 00
Garden Royal:	
First, J. C. McNeil	3 00
Second, C. B. Travis	2 00
Third, C. M. Handley	1 00
Gravenstein:	
First, Sumner Coolidge	3 00
Second, David L. Fiske	2 00
Third, I. A. Boston	1 00
Maiden's Blush:	
First, O. B. Hadwen	3 00
Second, E. S. Converse	2 00
Third, H. R. Kinney	1 00
Porter:	
First, George W. Stevens	3 00
Second, Thomas L. Perkins	2 00
Third, M. W. Chadbourne	1 00

Bietigheimer:
First, Sumner Coolidge 3 00
Pumpkin Sweet:
First, G. W. Stevens 3 00
Second, O. B. Hadwen 2 00
Third, John Parker 1 00
Washington Strawberry:
First, J. C. Stone 3 00
Second, Sumner Coolidge 2 00
Third, A. E. Hartshorn 1 00
Any other variety:
First, C. M. Handley, Wealthy 3 00
Second, C. M. Handley, Fall Orange 2 00
Third, W. H. Hunt, Mackintosh 1 00

CRAB APPLES. — Transcendent, twenty-four specimens:
First, L. J. Fosdick 2 00
Second, George W. Stevens 1 00
Any other variety:
First, M. W. Chadbourne, Hyslop 2 00
Second, F. J. Kinney, Montreal Beauty 1 00

PEARS. — Bartlett:
First, William Milman 3 00
Second, A. T. Brown 2 00
Third, George E. Freeman 1 00
Belle Lucrative:
First, E. S. Converse 3 00
Second, A. T. Brown 2 00
Third, L. M. Chase 1 00
Boussock:
First, Sumner Coolidge 3 00
Second, Charles E. Swain 2 00
Third, E. W. Wood 1 00
Hardy:
First, E. S Converse 3 00
Second, Charles F. Curtis 2 00
Third, L. M. Chase 1 00
Paradise of Autumn:
First, William Milman 3 00
Second, L. M. Chase 2 00
Third, Warren Fenno 1 00
Souvenir du Congrès:
First, Sumner Coolidge 3 00
Second, Miss Ellen M. Hersey 2 00
Third, Warren Fenno 1 00
Any other variety:
First, George E. Freeman, Sheldon 3 00
Second, A. T. Brown, Seckel 2 00
Third, Mrs. James McCormick 1 00

PEACHES. — Coolidge's Favorite:

First, Sumner Coolidge	3 00
Second, David L. Fiske	2 00
Early Crawford:	
First, Sumner Coolidge	3 00
Second, Francis Blake	2 00
Third, Charles E. Swain	1 00
Crosby:	
First, C. F. Hayward	3 00
Second, F. J. Kinney	2 00
Third, W. D. Hinds	1 00
Foster:	
First, Sumner Coolidge	3 00
Second, David L. Fiske	2 00
Third, Charles E. Swain	1 00
Oldmixon Freestone:	
First, Francis Blake	3 00
Second, Sumner Coolidge	2 00
Third, Charles S. Smith	1 00
Stump the World:	
First, Sumner Coolidge	3 00
Second, L. M. Chase	2 00
Third, George L. Brown	1 00
Any other variety:	
First, A. T. Brown, Champion	3 00
Second, Charles E. Swain, Champion	2 00
Third, Sumner Coolidge, Elberta	1 00

NECTARINES. — Any variety of outdoor culture:

First, Francis Blake	2 00
Second, Warren Fenno	1 00

PLUMS. — Imperial Gage:

Third, George V. Fletcher	1 00
Lombard:	
First, I. A. Boston	3 00
Second, H. R. Kinney	2 00
Third, George A. Walker	1 00
McLaughlin:	
First, W. D. Hinds	3 00
Washington:	
First, F. J. Kinney	3 00
Any other variety:	
First, Hittinger Brothers, Pond's Seedling	3 00
Second, George V. Fletcher, Yellow Egg	2 00
Third, H. R. Kinney, Bradshaw	1 00

JAPANESE PLUMS. — Any variety:

First, W. D. Hinds, Satsuma	3 00

NATIVE GRAPES. — Six bunches of Campbell's Early:

Second, F. J. Kinney	2 00
Third, J. S. Chase	1 00
Massasoit:	
First, Joseph S. Chase	3 00
Second, George Lincoln	2 00
Third, H. R. Kinney	1 00
Moore's Early:	
First, H. R. Kinney	3 00
Second, F. W. Damon	2 00
Third, J. S. Chase	1 00
Any other variety:	
First, J. S. Chase, Brighton	3 00
Second, F. J. Kinney, Worden	2 00
Third, F. W. Damon, Delaware	1 00
Any variety from girdled vines:	
First, F. J. Kinney, Worden	3 00
Second, H. R. Kinne,y Agawam	2 00
Third, H. R. Kinney, Delaware	1 00

SEPTEMBER 22.

Gratuity: —

J. S. Chase, Collection of grapes	2 00

ANNUAL EXHIBITION OF FRUITS AND VEGETABLES.

SEPTEMBER 27 AND 28.

Special Prizes.

Samuel Appleton Fund.

APPLES. — Baldwin, Joshua C. Stone	5 00
Hubbardston, W. H. Boyden	5 00
PEARS. — Bosc, Sumner Coolidge	5 00
Sheldon, Sumner Coolidge	5 00

Benjamin V. French Fund.

APPLES. — Gravenstein, E. M. Bruce	5 00
Rhode Island Greening, Sumner Coolidge	5 00

Marshall P. Wilder Fund.

PEARS. — Anjou:	
First, William Milman	4 00
Second, A. T. Brown	3 00
Third, Charles Whittier	2 00
Fourth, F. W. Damon	1 00

Bartlett:	
First, Varnum Frost	4 00
Second, William Milman	3 00
Third, A. T. Brown	2 00
Fourth, Sumner Coolidge	1 00
GRAPES.—Concord, twelve bunches:	
First, Ernest Lincoln	4 00
Second, F. W. Damon	3 00
Third, H. R. Kinney	2 00
Fourth, J. S. Chase	1 00
Worden, twelve bunches:	
First, F. J. Kinney	4 00
Second, H. R. Kinney	3 00
Third, J. S. Chase	2 00

Theodore Lyman Fund.

APPLES.—Baldwin:	
First, Sumner Coolidge	4 00
Second, Paul W. Costain	3 00
Third, Charles O. Johnson	2 00
Dutch Codlin:	
Second, Warren Fenno	2 00
Third, J. C. Stone	1 00
Fall Orange:	
First, C. M. Handley	3 00
Second, O. B. Hadwen	2 00
Third, C. T. Foster	1 00
Fameuse:	
First, Sumner Coolidge	3 00
Second, E. M. Bruce	2 00
Third, George V. Fletcher	1 00
Fletcher Russet:	
First, Charles F. Curtis	3 00
Second, George V. Fletcher	2 00
Third, W. E. Teele	1 00
Foundling:	
First, E. M. Bruce	4 00
Second, C. M. Handley	3 00
Gloria Mundi:	
First, E. M. Bruce	3 00
Golden Russet:	
First, H. R. Kinney	2 00
Second, E. M. Bruce	1 00
Gravenstein:	
First, Samuel Howe	4 00
Second, H. R. Kinney	3 00
Third, A. E. Hartshorn	2 00

Hubbardston:	
First, E. M. Bruce	4 00
Second, C. M. Handley	3 00
Third, M. W. Chadbourne	2 00
Hunt Russet:	
First, W. H. Boyden	3 00
Second, W. H. Hunt	2 00
Third, George F. Wheeler	1 00
Jacobs Sweet:	
First, M. Martin	3 00
Second, Charles F. Curtis	2 00
Lady's Sweet:	
First, David L. Fiske	2 00
Second, William C. Winter	1 00
Mackintosh:	
First, F. J. Kinney	4 00
Second, George C. Rice	3 00
Third, Mrs. F. A. Hale	2 00
Maiden's Blush:	
First, E. S. Converse	2 00
Second, O. B. Hadwen	1 00
Mother:	
First, George C. Rice	3 00
Second, H. R. Kinney	2 00
Third, George L. Brown	1 00
Northern Spy:	
First, George V. Fletcher	3 00
Second, A. E. Hartshorn	2 00
Third, E. M. Bruce	1 00
Porter:	
First, Sumner Coolidge	3 00
Second, M. W. Chadbourne	2 00
Third, C. M. Walker	1 00
Pound Sweet:	
First, George C. Rice	3 00
Second, Charles O. Johnson	2 00
Third, George V. Fletcher	1 00
Rhode Island Greening:	
First, E. M. Bruce	4 00
Second, A. E. Hartshorn	3 00
Third, W. H. Boyden	2 00
Roxbury Russet:	
First, Sumner Coolidge	4 00
Second, J. C. Stone	3 00
Third, F. O. Barrett	2 00
Sutton:	
First, F. J. Kinney	3 00

Second, A. E. Hartshorn	2 00
Third, David L. Fiske	1 00
Tolman Sweet:	
First, David L. Fiske	3 00
Second, George C. Rice	2 00
Third, W. H. Boyden	1 00
Tompkins King:	
First, E. J. Picanco	3 00
Second, George C. Rice	2 00
Third, Sumner Coolidge	1 00
Palmer:	
First, David L. Fiske	3 00
Second, E. M. Bruce	2 00
Third, O. B. Hadwen	1 00
Wealthy:	
First, J. S. Hodge	3 00
Second, W. D. Hinds	2 00
Third, E. U. Powers	1 00
Any other variety:	
First, Sumner Coolidge, Washington Strawberry	3 00
Second, George C. Rice, Twenty Ounce	2 00
Third, Warren Fenno, Alexander	1 00
CRAB APPLES. — Hyslop, twenty-four specimens:	
First, M. W. Chadbourne	2 00
Second, F. J. Kinney	1 00
Any other variety:	
First, F. J. Kinney, Montreal Beauty	2 00

Special Prizes offered by the Society.

PEARS. — Seckel, E. E. Doran	5 00
PEACHES. — Any variety, Sumner Coolidge, Elberta	5 00
NATIVE GRAPES. — Twelve bunches, any variety, J. S. Chase, Brighton	5 00

Regular Prizes.

PEARS. — Angouleme:	
First, A. T. Brown	4 00
Second, F. W. Damon	3 00
Third, Sumner Coolidge	2 00
Fourth, Edwin A. Hall	1 00
Bosc:	
First, A. T. Brown	4 00
Second, James M. Teele	3 00
Third, M. W. Chadbourne	2 00
Fourth, Sumner Coolidge	1 00

Clairgeau:	
First, Sumner Coolidge	3 00
Second, F. W. Damon	2 00
Third, Charles F. Curtis	1 00
Comice:	
First, A. T Brown	3 00
Second, L. M. Chase	2 00
Dana's Hovey:	
First, A. T. Brown	4 00
Second, F. W. Damon	3 00
Third, Mrs. Charles Whittier	2 00
Fourth, M. W. Chadbourne	1 00
Diel:	
First, A. T. Brown	3 00
Second, Charles E. Swain	2 00
Third, Sumner Coolidge	1 00
Fulton:	
First, E. S. Converse	3 00
Second, F. L. Weston	2 00
Third, Warren Fenno	1 00
Hardy:	
First, Charles F. Curtis	3 00
Second, Warren Fenno	2 00
Third, E. S. Converse	1 00
Howell:	
First, Sumner Coolidge	3 00
Second, J. E. Fuller	2 00
Third, Warren Fenno	1 00
Josephine of Malines:	
First, Warren Fenno	3 00
Lawrence:	
First, L. M. Chase	3 00
Second, Charles E. Swain	2 00
Third, A. T. Brown	1 00
Louise Bonne of Jersey:	
First, L. M. Chase	3 00
Second, A. T. Brown	2 00
Third, Edwin A. Hall	1 00
Marie Louise:	
First, Elbridge Torrey	3 00
Second, Charles E. Swain	2 00
Third, Warren Fenno	1 00
Merriam:	
First, F. W. Damon	3 00
Second, Sumner Coolidge	2 00
Third, Charles F. Curtis	1 00

Onondaga:
- First, Matthew Binney 3 00
- Second, Sumner Coolidge 2 00
- Third, John L. Bird 1 00

Seckel:
- First, Miss Elizabeth Miller 4 00
- Second, E. S. Converse 3 00
- Third, E. E. Doran 2 00
- Fourth, Charles Whittier 1 00

Sheldon:
- First, George V. Fletcher 4 00
- Second, Mrs. A. C. Wiggin 3 00
- Third, William Patterson 2 00
- Fourth, Sumner Coolidge 1 00

St. Michael Archangel:
- First, Warren Fenno 3 00
- Second, Warren Heustis & Son 2 00

Superfin:
- First, F. W. Damon 3 00
- Second, Sumner Coolidge 2 00
- Third, Warren Fenno 1 00

Urbaniste:
- First, E. S. Converse 3 00
- Second, John L. Bird 2 00
- Third, A. T. Brown 1 00

Vicar:
- First, E. S. Converse 3 00
- Second, A. T. Brown 2 00
- Third, George E. Freeman 1 00

Winter Nelis:
- First, A. T. Brown 3 00
- Second, William Barton 2 00
- Third, Edwin A. Hall 1 00

Any other variety:
- First, Warren Heustis & Son, Bonne d'Ezée 3 00
- Second, Warren Fenno, Adams 2 00
- Third, E. W. Green, Washington 1 00

Quinces. — Champion:
- First, Charles S. Smith 3 00
- Second, George V. Fletcher 2 00

Orange:
- First, George V. Fletcher 3 00
- Second, Ira A. Nay 2 00
- Third, J. S. Chase 1 00

Pear:
- First, George V. Fletcher 3 00
- Second, Ira A. Nay 2 00
- Third, George L. Brown 1 00

Rea:	
First, Warren Fenno	3 00
Any other variety:	
First, J. S. Chase, Meech	3 00
PEACHES. — Late Crawford:	
First, Sumner Coolidge	3 00
Second, Walter A. Robinson	2 00
Third, E. M. Bruce	1 00
Any other variety:	
First, W. D. Hinds, Crosby	3 00
Second, William Milman, Hind	2 00
Third, Sumner Coolidge, Crosby	1 00
PLUMS. — Yellow Egg:	
First, George V. Fletcher	2 00
Any other variety:	
First, W. D. Hinds, Satsuma	2 00
Second, H. R. Kinney, Lombard	1 00
NATIVE GRAPES. — Six bunches of Brighton:	
First, J. S. Chase	3 00
Second, F. W. Damon	2 00
Third, Charles W. Libby	1 00
Delaware:	
First, Charles W. Libby	4 00
Second, J. S. Chase	3 00
Third, F. W. Damon	2 00
Fourth, H. R. Kinney	1 00
Eumelan:	
First, J. S. Chase	3 00
Herbert:	
First, Charles W. Libby	3 00
Second, J. S. Chase	2 00
Iona:	
First, F. W. Damon	3 00
Second, Thomas H. Talbot	2 00
Third, J. S. Chase	1 00
Lindley:	
First, Charles W. Libby	3 00
Second, F. W. Damon	2 00
Niagara:	
First, E. A. Adams	3 00
Second, George V. Fletcher	2 00
Third, J. S. Chase	1 00
Pocklington:	
First, F. W. Damon	4 00
Second, Charles W. Libby	3 00
Third, J. S. Chase	2 00
Fourth, H. R. Kinney	1 00

Prentiss:
First, F. W. Damon 3 00
Second, A. T. Brown 2 00
Third, J. S. Chase 1 00
Wilder:
First, E. A. Adams 3 00
Any other variety:
First, J. S. Chase, Vergennes 3 00
Second, J. S. Chase, Diana 2 00
Third, F. W. Damon, Moore's Diamond 1 00
Any variety from girdled vines:
First, H. R. Kinney, Concord 3 00
Second, H. R. Kinney, Agawam 2 00
CRANBERRIES. — Half peck:
First, L. J. Fosdick, McFarlin's 3 00
Second, L. J. Fosdick, Gloriana 2 00
Third, L. J. Fosdick, Early Black 1 00

Gratuities:—

M. W. Chadbourne, Apples and Pears 1 00
Hon. Aaron Low, Plums 1 00
J. S. Chase, Grapes 1 00

OCTOBER 13.

Gratuities:—

J. T. Gilman, Peaches 1 00
Hon. Aaron Low, Grapes 1 00
J. S. Chase " 1 00

EXHIBITION OF WINTER FRUITS AND VEGETABLES.

NOVEMBER 17.

Benjamin V. French Fund.

APPLES. — Baldwin, E. F. Locke 5 00
Rhode Island Greening, C. F. Boyden 5 00

Society's Prizes.

APPLES. — Baldwin:
First, E. M. Bruce 3 00
Second, C. F. Boyden 2 00
Third, J. C. Stone 1 00

Danvers Sweet:
- First, W. H. Boyden 3 00
- Second, Warren Fenno 2 00
- Third, C. M. Handley 1 00

Fletcher Russet:
- First, George V. Fletcher 3 00

Hubbardston:
- First, Artemas Frost 3 00
- Second, M. W. Chadbourne 2 00
- Third, W. H Boyden 1 00

Hunt Russet:
- First, W. H. Boyden 3 00
- Second, C. Terry 2 00

Lady's Sweet:
- Second, William C. Winter 2 00

Northern Spy:
- First, A. E. Hartshorn 3 00
- Second, E. M. Bruce 2 00
- Third, George V. Fletcher 1 00

Rhode Island Greening:
- First, E. M. Bruce 3 00
- Second, C. F. Boyden 2 00
- Third, A. E. Hartshorn 1 00

Roxbury Russet:
- First, W. H. Boyden 3 00
- Second, Miss E. J. Cutter 2 00
- Third, A. E. Hartshorn 1 00

Tolman Sweet:
- First, George V. Fletcher 3 00
- Second, W. P. Plimpton 2 00
- Third, Mrs. A. E. Underwood 1 00

Tompkins King:
- First, C. F. Boyden 3 00
- Second, J. G. Drew 1 00
- Third, George C. Rice 1 00

Any other variety:
- First, A. E. Hartshorn, Sutton 3 00
- Second, George C. Rice, Mackintosh 2 00
- Third, William H. Spooner, Wagener 1 00

PEARS. — Angouleme:
- First, A. T. Brown 4 00
- Second, Warren Fenno 3 00
- Third, F. W. Damon 2 00
- Fourth, William Milman 1 00

Anjou:
- First, William Milman 4 00
- Second, F. W. Damon 3 00

Third, A. K. Gould	2 00
Fourth, E. M. Bruce	1 00
Clairgeau:	
First, F. W. Damon	3 00
Second, A. K. Gould	2 00
Third, M. W. Chadbourne	1 00
Comice:	
First, Warren Fenno	3 00
Dana's Hovey:	
First, A. T. Brown	4 00
Second, F. W. Damon	3 00
Third, Charles Whittier	2 00
Fourth, Warren Fenno	1 00
Diel:	
First, A. T. Brown	3 00
Second, Edwin A. Hall	2 00
Glout Morceau:	
First, Edwin A. Hall	3 00
Second, Mrs. A. A. Johnson	2 00
Josephine of Malines:	
First, Warren Fenno	3 00
Second, J. L. Bird	2 00
Langelier:	
First, William H. Spooner	3 00
Second, F. W. Damon	2 00
Third, A. T. Brown	1 00
Lawrence:	
First, Warren Fenno	3 00
Second, A. T. Brown	2 00
Third, M. W. Chadbourne	1 00
Vicar:	
First, A. T. Brown	3 00
Second, C. A. Jones	2 00
Third, E. S. Converse	1 00
Winter Nelis:	
First, A. T. Brown	3 00
Second, Theodore M. Plimpton	2 00
Third, William Barton	1 00
Any other variety:	
First, F. W. Damon, Superfin	3 00
Second, C. B. Wiggin, Sheldon	2 00
Third, George V. Fletcher, Bosc	1 00
Quinces. — Any variety:	
First, J. S. Chase, Champion	3 00
Second, J. S. Chase, Meech	2 00
Third, E. M. Bruce, Champion	1 00

Gratuities:—

J. S. Chase, Grapes		2 00
H. W. Trowbridge, Cranberries		1 00
L. J. Fosdick	"	1 00
C. Terry	"	1 00

E. W. Wood,
Charles F. Curtis,
O. B. Hadwen,
Warren Fenno,
Samuel Hartwell,
J. Willard Hill,
Sumner Coolidge,

Committee on Fruits.

REPORT

OF THE

COMMITTEE ON VEGETABLES.

FOR THE YEAR 1900.

By WARREN HOWARD HEUSTIS, CHAIRMAN.

At this time of the year we look backward to see where we could have improved. Owing to an extremely dry season, we naturally looked for poor specimens, but we were pleased to find that the vegetables came up to the usual high standard. There were more exhibits of good vegetables this year than for some time past. We have a few new growers and most of the old ones still favor us. The shows during the winter and in fact during the entire season were very well sustained and the competition was quite keen and for the most part good natured, and, while there were no remarkable exhibits, the tone of the whole was quite high.

On July 14 some very fine specimens of new Hybrid Melons were shown by Elbridge T. Gerry of Newport, R. I., (Arthur Griffin, gardener) and were awarded a First Class Certificate of Merit.

A new Tomato, Maule's 1900, shown for the first time, seems to be worthy of general cultivation.

At the Annual Fruit and Vegetable Show, E. C. Lewis was awarded the Society's Silver Medal for about a hundred varieties of well grown vegetables. The Culinary Herbs at this show attracted a great deal of attention and inquiry and were worthy of special mention.

During the year we have awarded in prizes and gratuities $1,177, leaving an unexpended balance of $23.

For the Committee,

WARREN HOWARD HEUSTIS, *Chairman.*

PRIZES AND GRATUITIES AWARDED FOR VEGETABLES.

1900.

JANUARY 6.

RADISHES.— Four bunches of any variety:

First, A. E. Hartshorn	$3 00
Second, George D. Moore	2 00

SALSIFY.— Twelve specimens:

First, Warren Heustis & Son	3 00
Second, D. L. Tappan	2 00
Third, A. E. Hartshorn	1 00

CUCUMBERS.— Pair of any variety:

First, Mrs. John L. Gardner	3 00

CAULIFLOWERS.— Four specimens:

First, C. M. Handley	3 00

CELERY.— Four roots:

First, Warren Heustis & Son, Boston Market	3 00
Second, Warren Heustis & Son, Paris Golden	2 00
Third, Warren Heustis & Son, Giant Pascal	1 00

PARSLEY.— Two quarts:

First, W. N. Craig, Dobbie's Selected	2 00
Second, W. N. Craig, Chappell's Matchless	1 00

TOMATOES.— Twelve specimens:

First, Francis Blake, Best of All	3 00
Second, Francis Blake, Conference	2 00
Third, W. C. Winter, Stone	1 00

Gratuities:—

C. M. Handley, Cauliflowers	1 00
A. E. Hartshorn, Collection	3 00
Warren Heustis & Son, "	1 00

JANUARY 13.

Gratuity:—

Mrs. E. M. Gill, Mushrooms	1 00

JANUARY 27.

Gratuities:—

Mrs. E. M. Gill, Tomatoes	1 00
George D. Moore, Lettuce	1 00

FEBRUARY 3.

RADISHES.— Four bunches of any variety:

First, Varnum Frost	3 00
Second, A. E. Hartshorn	2 00
Third, A. F. Coolidge	1 00

SALSIFY.— Twelve specimens:

First, Warren Heustis & Son	3 00
Second, D. L. Tappan	2 00
Third, A. E. Hartshorn	1 00

CELERY.— Four roots:

First, Warren Heustis & Son, Boston Market	3 00
Second, Warren Heustis & Son, Giant Pascal	2 00
Third, A. E. Hartshorn	1 00

LETTUCE.— Four heads of Tennisball:

First, George D. Moore	3 00
Second, A. E. Hartshorn	2 00
Third, A. F. Coolidge	1 00

TOMATOES.— Twelve specimens:

First, Francis Blake, Best of All	3 00
Second, H. Dumaresq, " "	2 00
Third, S. J. Goddard, Eclipse	1 00

Gratuities:—

A. E. Hartshorn, Collection	3 00
Warren Heustis & Son, "	2 00
Mrs. E. M. Gill, "	1 00

FEBRUARY 10.

Gratuity:—

Warren Heustis & Son, Collection	1 00

FEBRUARY 24.

Gratuities:—

Hon. Aaron Low, Collection	1 00
Warren Heustis & Son, "	1 00

MARCH 3.

Gratuities:—

Hon. Aaron Low, Spinach	1 00
Warren Heustis & Son, Celery	1 00

MARCH 10.

Gratuities:—

George D. Moore, Lettuce	1 00
Wyman Brothers, "	1 00
Mrs. E. M. Gill, Tomatoes	1 00
Hon. Aaron Low, Spinach	1 00
Warren Heustis & Son, Collection	2 00

SPRING EXHIBITION.

MARCH 20, 21, 22, AND 23.

William J. Walker Fund.

RADISHES.— Four bunches of Turnip Rooted:

First, Varnum Frost	2 00
Second, A. E. Hartshorn	1 00

CUCUMBERS.— Pair of White Spine:

First, E. M. Bruce	3 00
Second, Irving B. Frost	2 00
Third, Francis Blake	1 00

SPINACH.— Half-peck:

First, Hon. Aaron Low, Improved Thick Leaved	3 00
Second, Hon. Aaron Low, Parisian	2 00
Third, Hon. Aaron Low, Victoria	1 00

DANDELIONS.— Peck:

First, J. C. Stone	3 00
Second, A. E. Hartshorn	2 00

LETTUCE.— Four heads of Tennisball:

First, Wyman Brothers	3 00
Second, A. E. Hartshorn	2 00
Third, George D. Moore	1 00

WATER CRESS.— Two quarts:

First, A. E. Hartshorn	2 00

PARSLEY.— Two quarts:

First, S. J. Goddard, Extra Triple Curled	2 00
Second, S. J. Goddard, Chappell's Matchless	1 00

RHUBARB.— Twelve stalks:

First, Wyman Brothers	3 00
Second, W. H. Derby	2 00
Third, George Sanderson	1 00

TOMATOES.— Twelve specimens:

First, Francis Blake	3 00

Gratuities:—

Mrs. John L. Gardner, Cucumbers	1 00
Wyman Brothers, Lettuce	1 00
A. E. Hartshorn, Collection	3 00

MARCH 31.

Gratuity:—

George D. Moore, Lettuce	1 00

APRIL 7.

BEETS.— Twelve specimens of Turnip Rooted:

First, A. Nixon	3 00
Second, W. Warburton	2 00

PARSNIPS.— Twelve specimens:
- First, A. Nixon 3 00
- Second, Warren Heustis & Son 2 00
- Third, W. Warburton 1 00

RADISHES.— Four bunches:
- First, A. E. Hartshorn 2 00

LETTUCE.— Four heads:
- First, George D. Moore 3 00
- Second, A. E. Hartshorn 2 00
- Third, Wyman Brothers 1 00

CUCUMBERS.— Pair of White Spine:
- First, William Proctor 3 00
- Second, George D. Moore 2 00

Any other variety:
- First, Mrs. John L. Gardner, Telegraph 3 00
- Second, Mrs. John L. Gardner, Sion House 2 00

Gratuities:—

Hon. Aaron Low, Spinach 1 00
W. H. Derby, Rhubarb 1 00
Hon. Aaron Low, Collection of Potatoes 5 00
Warren Heustis & Son, Collection 1 00
Wyman Brothers, " 1 00
A. E. Hartshorn, " 1 00
George D. Moore, " 1 00

APRIL 21.

Gratuity:—

Warren Heustis & Son, Dandelions 1 00

APRIL 28.

Gratuity:—

Warren Heustis & Son, Dandelions 1 00

MAY 5.

William J. Walker Fund.

ASPARAGUS.— Four bunches:
- First, Varnum Frost 3 00
- Second, William H. Hunt 2 00
- Third, Norris F. Comley 1 00

CUCUMBERS.— Pair of White Spine:
- First, George D. Moore 3 00
- Second, William Proctor 2 00
- Third, A. F. Coolidge 1 00

Any other variety:
- First, Mrs. John L. Gardner 3 00
- Second, Mrs. John L. Gardner 2 00

SPINACH.— Peck:

First, A. E. Hartshorn	3 00

DANDELIONS.— Peck:

First, Varnum Frost	2 00
Second, W. H. Derby	1 00

LETTUCE.— Four heads:

First, Edward Powell	3 00
Second, W. H. Derby	2 00
Third, A. E. Hartshorn	1 00

RHUBARB.— Twelve stalks, open culture:

First, George D. Moore	3 00
Second, A. E. Hartshorn	2 00
Third, Warren Heustis & Son	1 00

TOMATOES.— Twelve specimens:

First, Edward Powell, Frogmore	3 00
Second, E. M. Bruce, Best of All	2 00
Third, Francis Blake, " "	1 00

Gratuities:—

Mrs. E. M. Gill, Rhubarb	1 00
George B. Gill, "	1 00
Edward Powell, Collection	2 00
Hon. Aaron Low, "	1 00
George D. Moore, "	1 00
Warren Heustis & Son, "	1 00

MAY 12.

Gratuities:—

George D. Moore, Radishes	1 00
Warren Heustis & Son, Rhubarb	1 00

MAY 19.

Gratuities:—

Warren Heustis & Son, Radishes	1 00
W. H. Hunt, Asparagus	1 00
Hon. Aaron Low, Rhubarb	1 00
Edward Powell, Collection	3 00

MAY 26.

Gratuities:—

Norris F. Comley, Asparagus	1 00
W. H. Hunt, "	1 00
Warren Heustis & Son, Collection	1 00

JUNE 2.

Gratuities:—

Warren Heustis & Son, Lettuce	1 00
Mrs. E. M. Gill, Rhubarb	1 00
George D. Moore, Collection	1 00

JUNE 9.

Gratuities:—

George D. Moore, Cucumbers	1 00
Warren Heustis & Son, Lettuce	1 00

RHODODENDRON SHOW.

JUNE 12 AND 13.

Theodore Lyman Fund.

BEETS.—Twelve specimens:	
First, A. E. Hartshorn	3 00
Second, George D. Moore	2 00
CARROTS.—Twelve specimens:	
First, Edward Powell, Sutton's	3 00
Second, Edward Powell, Early Horn	2 00
Third, A. E. Hartshorn, " "	1 00
RADISHES.—Four bunches of Turnip Rooted:	
First, George D. Moore	2 00
Second, A. E. Hartshorn	1 00
Long Scarlet:	
First, Warren Heustis & Son	2 00
Second, George D. Moore	1 00
ASPARAGUS. — Four bunches, twelve stalks each:	
First, W. H. Hunt	3 00
Second, Norris F. Comley	2 00
Third, A. E. Hartshorn	1 00
CUCUMBERS. — Pair:	
First, George D. Moore	3 00
Second, J. C. Stone	2 00
Third, W. H. Derby	1 00
LETTUCE. — Four heads:	
First, Warren Heustis & Son, Big Boston	3 00
Second, George D. Moore, Tennisball	2 00
Third, Warren Heustis & Son, "	1 00
RHUBARB. — Twelve stalks:	
First, Warren Heustis & Son, Victoria	3 00
Second, Warren Heustis & Son, Seedling	2 00
Third, Edward Powell, Victoria	1 00

Gratuities:—

James Anderson, Parsley,	1 00
Warren Heustis & Son, Collection	3 00
George D. Moore, "	3 00
Edward Powell, "	3 00
A. E. Hartshorn, "	2 00

JUNE 16.

Gratuities:—

W. H. Hunt, Asparagus	1 00
A. W. Crockford, Cucumbers	1 00
George D. Moore, "	1 00
W. C. Winter, Tomatoes	1 00
Edward Powell, Collection	2 00
Mrs. John L. Gardner, "	1 00

ROSE AND STRAWBERRY SHOW.

JUNE 22 and 23.

BEETS. — Twelve Summer Turnip Rooted:	
First, A. E. Hartshorn	3 00
Second, J. C. Stone	2 00
Third, George D. Moore	1 00
ONIONS. — Twelve specimens:	
First, Edward Powell	3 00
Second, Edward Powell	2 00
Third, George D. Moore	1 00
CUCUMBERS. — Pair of White Spine:	
First, George D. Moore	3 00
Second, J. C. Stone	2 00
Third, A. W. Crockford	1 00
Any other variety:	
Second, Edward Powell	2 00
CABBAGES. — Three of any variety, trimmed:	
First, George D. Moore	3 00
Second, George D. Moore	2 00
Third, Warren Heustis & Son	1 00
LETTUCE. — Four heads of Tennisball:	
First, E. C. Lewis	3 00
Second, George D. Moore	2 00
Third, Warren Heustis & Son	1 00
Any other variety:	
First, E. C. Lewis	3 00
Second, Edward Powell	2 00
PEAS. — Half-peck of Nott's Excelsior:	
First, J. W. Burns	3 00
Second, A. E. Hartshorn	2 00
Third, Mrs. John L. Gardner	1 00
Any other variety:	
First, Edward Powell	3 00
Second, A. E. Hartshorn	2 00
Third, W. Warburton	1 00

Gratuities:—

Warren Heustis & Son, Collection	5 00
George D. Moore, "	3 00
W. C. Winter, "	2 00
A. E. Hartshorn, "	1 00
W. H. Hunt, "	1 00

JUNE 30.

POTATOES. — Twelve specimens:	
First, George D. Moore	3 00
ONIONS. — Twelve specimens:	
First, Edward Powell	2 00
Second, George D. Moore	1 00
SQUASHES. — Four Long Warted:	
First, J. C. Stone	3 00
Four Scalloped:	
First, J. C. Stone	3 00
CABBAGES. — Three of any variety:	
First, George D. Moore	3 00
Second, George D. Moore	2 00
Third, Warren Heustis & Son	1 00
BEANS. — Half-peck of Wax:	
First, John Sheahan	3 00
PEAS. — Half-peck of American Wonder:	
First, A. E. Hartshorn	3 00
Any other variety:	
First, Edward Powell, Gradus	3 00
Second, E. C. Lewis, "	2 00
Third, George D. Moore	1 00

Gratuities:—

Marcellus A. Patten, Tomatoes	1 00
Warren Heustis & Son, Collection	2 00
E. C. Lewis, "	2 00
George D. Moore, "	2 00
Edward Powell, "	1 00
W. Warburton, "	1 00

JULY 7.

Levi Whitcomb Fund.

POTATOES. — Twelve specimens:	
First, George D. Moore, Bovee	3 00
Second, George D. Moore, Hebron	2 00
CABBAGES. — Three Drumhead, trimmed:	
First, George D. Moore	3 00
Second, George D. Moore	2 00
Third, Warren Heustis & Son	1 00

LETTUCE.—Four heads:

First, Miss M. S. Walker, Sutton's Giant	3 00
Second, E. C. Lewis, Salamander	2 00
Third, E. C. Lewis, Deacon	1 00

BEANS.— Half-peck of Wax:

First, A. E. Hartshorn	3 00
Second, J. C. Stone	2 00
Third, I. E. Coburn	1 00

Half-peck of any green variety:

First, I. E. Coburn, Cranberry	3 00
Second, J. C. Stone, Mohawk	2 00
Third, George D. Moore, "	1 00

TOMATOES.— Twelve specimens, open culture:

First, E. C. Lewis	3 00

Gratuities:—

George B. Gill, Peas	1 00
Warren Heustis & Son, Collection	3 00
E. C. Lewis, "	2 00
George D. Moore, "	2 00
A. E. Hartshorn, "	1 00

JULY 14.

POTATOES.— Twelve specimens:

First, J. W. Burns, Bovee	3 00
Second, George D. Moore, "	2 00
Third, E. C. Lewis, Bliss's Triumph	1 00

LETTUCE.— Four heads of Tennisball:

First, A. E. Hartshorn	2 00
Second, Warren Heustis & Son	1 00

Any other variety:

First, E. C. Lewis	2 00

PEAS.— Half-peck of Stratagem:

First, George B. Gill	3 00
Second, A. E. Hartshorn	2 00

Half-peck of any other variety:

First, A. E. Hartshorn, Telephone	3 00
Second, E. C. Lewis, Carter's Daisy	2 00
Third, E. C. Lewis, Gradus	1 00

TOMATOES.— Twelve specimens:

First, Varnum Frost	3 00
Second, J. C. Stone	2 00

Gratuities:—

E. C. Lewis, Collection	2 00
A. E. Hartshorn, "	2 00
Warren Heustis & Son, "	2 00

Edward Powell Collection, ... 2 00
Hon. Aaron Low, " 1 00
J. W. Burns, " 1 00
Elbridge T. Gerry, Newport, R I., New Hybrid Melons, First Class Certificate of Merit.

JULY 21.

POTATOES.— Twelve specimens:
First, H. R. Kinney, Somerset 3 00
Second, E. C. Lewis 2 00
Third, George D. Moore 1 00
SWEET CORN.—Twelve ears of Crosby:
First, George D. Moore 3 00
Any other variety:
First, J. C. Stone 3 00
Second, George D. Moore 2 00
TOMATOES.— Twelve specimens:
First, A. E. Hartshorn, Acme 3 00
Second, Varnum Frost, Comrade 2 00
Third, J. C. Stone, Atlantic 1 00

Gratuities:—
Edward Powell, Collection 2 00
Warren Heustis & Son, " 2 00
E. C. Lewis, " 2 00
J. W. Burns, " 1 00
Hon. Aaron Low, " 1 00

JULY 28.

BEETS.— Twelve specimens:
First, J. C. Stone 3 00
Second, E. C. Lewis 2 00
Third, A. E. Hartshorn 1 00
TURNIPS.— Twelve specimens:
First, George F. Wheeler 2 00
CABBAGES.— Three specimens:
First, George D. Moore 3 00
Second, Warren Heustis & Son 2 00
Third, Warren Heustis & Son 1 00
BEANS.— Two quarts of Goddard, shelled:
First, I. E. Coburn 3 00
Horticultural:
First, Joseph Thorpe 3 00
Second, I. E. Coburn 2 00
Third, J. C. Stone 1 00
TOMATOES.— Twelve specimens:
First, A. E. Hartshorn 3 00

Second, A. F. Coolidge	2 00
Third, J. C. Stone	1 00
EGG PLANT.— Four specimens of Round Purple:	
First, Sumner Coolidge	3 00
Second, A. F. Coolidge	2 00
Gratuities:—	
George D. Moore, Collection	2 00
E. C. Lewis, "	2 00
A. E. Hartshorn, "	2 00
Warren Heustis & Son, "	2 00
Hon. Aaron Low, "	1 00

AUGUST 4.

CARROTS.— Twelve specimens:	
First, W. Warburton	3 00
Second, E. C. Lewis	2 00
Third, A. E. Hartshorn	1 00
SALMON FLESH MELONS.— Four specimens:	
First, George D. Moore	3 00
Second, Varnum Frost	2 00
SWEET CORN.— Twelve ears:	
First, Sumner Coolidge	3 00
Second, E. C. Lewis	2 00
Third, George D. Moore	1 00
TOMATOES.— Twelve specimens:	
First, W. H. Hunt	3 00
Second, Varnum Frost	2 00
Third, Hon. Aaron Low	1 00
EGG PLANT.— Four specimens:	
First, Sumner Coolidge	3 00
Second, Joseph Thorpe	2 00
Third, A. F. Coolidge	1 00
Gratuities:—	
A. E. Hartshorn, Collection	2 00
Joseph Thorpe, "	1 00
Hon. Aaron Low, "	1 00
E. C. Lewis, "	1 00

AUGUST 11

POTATOES.— Twelve specimens:	
First, E. C. Lewis, Hebron	3 00
Second, W. Warburton, Bovee	2 00
Third, E. C. Lewis, White Elephant	1 00
ONIONS.— Twelve specimens:	
First, E. C. Lewis, Prize Taker	3 00

Second, W. J. Clemson, Prize Taker	2 00
Third, W. J. Clemson, Danvers	1 00
GREEN FLESH MELONS.— Four specimens:	
First, A. E. Hartshorn	3 00
SALMON FLESH MELONS.— Four specimens:	
First, Varnum Frost	3 00
Second, George D. Moore	2 00
Third, J. C. Stone	1 00
CELERY.— Four roots of any variety:	
First, A. F. Coolidge	3 00
Second, Warren Heustis & Son	2 00
Third, W. Warburton	1 00
BEANS.— Two quarts of Lima:	
First, Sumner Coolidge, Large Lima	3 00
Second, Sumner Coolidge, Small Lima	2 00
Two quarts of Goddard, shelled:	
First, A. E. Hartshorn	3 00
Second, D. L. Fiske	2 00
SWEET CORN.— Twelve ears of Potter's Excelsior:	
First, Mrs. E. M. Gill	3 00
Second, Sumner Coolidge	2 00
Any other variety:	
First, A. E. Hartshorn, Moore's	3 00
Second, E. C. Lewis, Crosby	2 00
TOMATOES.— Twelve specimens:	
First, A. F. Coolidge	3 00
Second, J. C. Stone	2 00
Third, Joseph Thorpe	1 00
PEPPERS.— Twelve specimens of Squash:	
First, Hon. Aaron Low	3 00
Second, N. T. Kidder	2 00
Third, E. C. Lewis	1 00
Any other variety:	
First, E. C. Lewis, Bull Nose	3 00
Second, E. C. Lewis, Ruby King	2 00
Gratuities:—	
A. E. Hartshorn, Collection	2 00
W. Warburton, "	2 00
Joseph Thorpe, "	1 00
Hon. Aaron Low, "	1 00

AUGUST 18.

BEETS.— Twelve specimens:	
First, George D. Moore	3 00
Second, E. C. Lewis	2 00
Third, J. C. Stone	1 00

GREEN FLESH MELONS.— Four specimens:

First, A. E. Hartshorn	3 00

SALMON FLESH MELONS.— Four specimens:

First, Varnum Frost	3 00
Second, J. C. Stone	2 00

WATERMELONS.— Pair:

First, C. Terry	3 00
Second, J. C. Stone	2 00

CABBAGES.— Three of any variety, trimmed:

First, Warren Heustis & Son, Number 2	3 00
Second, Warren Heustis & Son, All Seasons	2 00

CELERY.— Four roots:

First, A. F. Coolidge	3 00
Second, W. Warburton	2 00
Third, Warren Heustis & Son	1 00

BEANS.— Two quarts of Large Lima:

First, E. C. Lewis	3 00
Second, A. E. Hartshorn	2 00

Two quarts of Small Lima:

First, J. C. Stone	3 00
Second, W. Warburton	2 00
Third, A. E. Hartshorn	1 00

MARTYNIAS.— Twelve specimens:

First, E. S. Converse	2 00
Second, E. C. Lewis	1 00

NATIVE MUSHROOMS.— Named collection, of not less than five edible varieties:

First, Miss Alice L. Grinnell	3 00
Second, Miss Ellen W. Rumrill	2 00

Gratuities:—

A. E. Hartshorn, Collection	2 00
Hon. Aaron Low, "	1 00
E. C. Lewis, "	1 00
Warren Heustis & Son, "	1 00

AUGUST 25.

Gratuities:—

A. A. Marshall, Melons	1 00
Warren Heustis & Son, Salsify	1 00
Hon. Aaron Low, Collection	1 00

SEPTEMBER 1.

Gratuities:—

George B. Gill, Collection	1 00
Mrs. E. M. Gill, "	1 00
Hon Aaron Low, "	1 00

SEPTEMBER 15.

TURNIPS.— Twelve specimens:
First, E. C. Lewis 3 00
WATERMELONS.— Pair:
First, E. C. Lewis 3 00
Second, J. C. Stone 2 00
Third, A. E. Hartshorn 1 00
CAULIFLOWERS.— Four specimens:
First, C. M. Handley 3 00
Second, W. H. Teele 2 00
Third, De Souza Brothers 1 00
LETTUCE.— Four heads of any variety:
First, Sumner Coolidge 3 00
Second, A. F. Coolidge 2 00
Third, E. C. Lewis 1 00
CELERY.— Four roots of any variety:
First, W. Warburton 3 00
Second, A. F. Coolidge 2 00
Third, Joseph Thorpe 1 00
PARSLEY.— Two quarts:
First, W. J. Clemson 2 00
Second, W. J. Clemson 1 00
BEANS.— Two quarts of Large Lima:
First, Mrs. E. M. Gill 3 00
Second, E. C. Lewis 2 00
Third, C. M. Handley 1 00
SWEET CORN.— Twelve ears of any variety:
First, O. R Robbins 3 00
Second, E. C. Lewis 2 00
Third. A. F. Coolidge 1 00
EGG PLANTS.— Four Round Purple:
First, A. W. Crockford 3 00
Second, E. C. Lewis 2 00
Third, A. F. Coolidge 1 00
TOMATOES.— Twelve Aristocrat:
First, Varnum Frost 3 00
Second, A. F. Coolidge 2 00
Third, Warren Heustis & Son 1 00
Comrade:
First, Warren Heustis & Son 3 00
Second, A. F. Coolidge 2 00
Third, Hon. Aaron Low 1 00
May's Favorite:
First, Hon. Aaron Low 3 00
Second, Warren Heustis & Son 2 00
Third, Varnum Frost 1 00

Any other variety:
First, Hon. Aaron Low, Maule's 1900 . . . . . 3 00
Second, Joseph Thorpe, Stone 2 00
Third, Varnum Frost, " 1 00

MARTYNIAS.— Twelve specimens:
First, E. S. Converse 2 00
Second, W. J. Clemson 1 00

PEPPERS.— Twelve specimens of Squash:
First, Hon. Aaron Low 2 00
Second, George Lincoln 1 00
Any other variety:
First, E. C. Lewis 2 00
Second, A. E. Hartshorn 1 00

NATIVE MUSHROOMS.— Named collection, not less than five edible varieties:
First, Miss Alice L. Grinnell 3 00

Gratuities:—
A. E. Hartshorn, Collection 1 00
E. C. Lewis, " 1 00
Warren Heustis & Son, " 1 00

ANNUAL EXHIBITION OF FRUITS AND VEGETABLES.

SEPTEMBER 27 AND 28.

BEETS.— Twelve Turnip Rooted:
First, George D. Moore 3 00
Second, A. E. Hartshorn 2 00
Third, E. C. Lewis 1 00

CARROTS.— Twelve Long Orange:
First, H. R. Kinney 3 00
Second, E. C. Lewis 2 00
Third, W. Warburton 1 00
Twelve Intermediate:
First, H. R. Kinney 3 00
Second, George D. Moore 2 00
Third, H. R. Kinney 1 00

PARSNIPS.— Twelve Long:
First, George D. Moore 3 00
Second, Warren Heustis & Son 2 00
Third, A. E. Hartshorn 1 00

POTATOES.— Twelve Carman No. 1:
First, E. C. Lewis 3 00
Second, Elliott Moore 2 00
Clark:
First, E. C. Lewis 3 00
Second, H. R. Kinney 2 00
Third, Hon. Aaron Low 1 00

Early Fortune:
First, Hon. Aaron Low 3 00
Second, J. W. Burns 2 00
Hebron:
First, H. R. Kinney 3 00
Second, De Souza Brothers 2 00
Third, Walter Warburton 1 00
Rose:
First, E. C. Lewis 3 00
Second, H. R. Kinney 2 00
Third, J. W. Burns 1 00
Any other variety:
First, E. A. Adams, New Queen 3 00
Second, H. R. Kinney, Sir Walter Raleigh 2 00
Third, H. R. Kinney, Bovee 1 00
SALSIFY.— Twelve specimens:
First, George D. Moore 3 00
Second, Warren Heustis & Son 2 00
Third, E. C. Lewis 1 00
TURNIPS.— Twelve Flat:
First, E. C. Lewis 3 00
Second, George F. Wheeler 2 00
Third, W. Wheeler 1 00
Swedish:
First, E. C. Lewis 3 00
ONIONS.— Twelve Danvers:
First, Perley Davis 3 00
Second, W. J. Clemson 2 00
Third, E. M. Bruce 1 00
Red:
First, E. C. Lewis 3 00
Second, W. J. Clemson 2 00
Third, Perley Davis 1 00
White:
First, Perley Davis 2 00
Second, A. E. Hartshorn 1 00
Any other variety:
First, Perley Davis, Prize Taker 3 00
Second, W. J. Clemson, " 2 00
Third, E. C. Lewis, Asa Craig 1 00
SQUASHES.— Three Bay State:
First, George F. Wheeler 3 00
Second, A. E. Hartshorn 2 00
Third, Wilfred Wheeler 1 00
Hubbard:
First, A. F. Coolidge 3 00
Second, A. E. Hartshorn 2 00
Third, E. C. Lewis 1 00

Hybrid Turban:
First, A. E. Hartshorn 3 00
Second, E. C. Lewis 2 00
Marblehead:
First, E. C. Lewis 3 00
Marrow:
First, E. C. Lewis 3 00
Second, George F. Wheeler 2 00
Any other variety:
First, A. E. Hartshorn, Seedling 3 00
Second, Hon. Aaron Low, No. 10 . . . . . 2 00
Third, A. E. Hartshorn, Warren 1 00

CUCUMBERS.— Pair of White Spine:
First, W. A. Bruce 3 00
Second, E. M. Bruce 2 00
Any other variety:
First, Joseph Thorpe, Emerald 3 00
Second, D. T. Curtis, Japan Tree 2 00

WATERMELONS.— Two specimens:
First, E. C. Lewis 3 00
Second, E. C. Lewis 2 00
Third, Elliott Moore 1 00

BRUSSELS SPROUTS.— Half-peck:
First, A. E. Hartshorn 3 00
Second, A. E. Hartshorn 2 00
Third, George F. Wheeler 1 00

CABBAGES.— Three Drumhead, trimmed:
First, A. Nixon 3 00
Second, Hon. Aaron Low 2 00
Third, E. C. Lewis 1 00
Red:
First, W. Warburton 3 00
Second, E. C. Lewis 2 00
Third, A. Nixon 1 00
Savoy:
First, Hon. Aaron Low 3 00
Second, W. Warburton 2 00
Third, A. Nixon 1 00

CAULIFLOWERS.— Four specimens:
First, C. M. Handley 5 00
Second, W. H. Teele 4 00
Third, De Souza Brothers 3 00

CELERY.— Four roots of Paris Golden, best kept during the exhibition:
First, A. F. Coolidge 5 00
Second, W. Warburton 4 00
Third, A. Nixon 3 00

Any other variety:
First, A. Nixon, White Plume 5 00
ENDIVE.— Four specimens:
First, E. C. Lewis 3 00
Second, C. F. Curtis 2 00
Third, A. E. Hartshorn 1 00
LETTUCE.— Four heads:
First, A. F. Coolidge 3 00
Second, J. C. Stone 2 00
Third, E. M. Bruce 1 00
PARSLEY.— Two quarts:
First, W. J. Clemson 2 00
Second, J. S. Bailey 1 00
HORSERADISH.— Six roots, present year's growth:
First, H. R. Kinney 2 00
Second, A. Nixon 1 00
FIELD CORN.— Twenty-five ears, traced:
First, B. P. Winch 3 00
Second, Elliott Moore 2 00
Third, Elliott Moore 1 00
SWEET CORN.— Twelve ears:
First, A. E. Hartshorn 3 00
Second, E. C. Lewis 2 00
Third, A. Nixon 1 00
EGG PLANTS.— Four Round Purple:
First, A. W. Crockford 3 00
Second, A. F. Coolidge 2 00
Third, Joseph Thorpe 1 00
TOMATOES.— Twelve Aristocrat:
First, Joseph Thorpe 3 00
Second, Hon. Aaron Low 2 00
Third, Varnum Frost 1 00
May's Favorite:
First, Hon. Aaron Low 3 00
Second, Varnum Frost 2 00
Third, Mrs. A. W. Spencer 1 00
Stone:
First, Varnum Frost 3 00
Second, W. Warburton 2 00
Third, Warren Heustis & Son 1 00
Any other variety:
First, Hon. Aaron Low, Maule's 1900 . . . . . 3 00
Second, Warren Heustis & Son, Hybrid 2 00
Third, Joseph Thorpe, Matchless 1 00
PEPPERS.— Twelve specimens of Squash:
First, Hon. Aaron Low 3 00
Second, George W. Jameson 2 00
Third, A. F. Coolidge 1 00

Any other variety:

First, W. Warburton, Giant	3 00
Second, E. C. Lewis, Bull Nose	2 00
Third, A. Nixon, Ruby King	1 00

CULINARY HERBS.— Collection, named:

First, W. J. Clemson	5 00
Second, A. E. Hartshorn	4 00
Third, W. Warburton	3 00

Gratuities:—

Mrs. E. M. Gill, Beans	1 00
L. Cueci, Gourd	1 00
J. W. Burns, Collection of Potatoes	1 00
W. H. Burlin, Collection of Tomatoes	1 00
James Comley, Collection	5 00
Warren Heustis & Son, "	5 00
W. J. Clemson, "	3 00
W. Warburton, "	3 00
E. C. Lewis "	Silver Medal.

OCTOBER 20.

Gratuity:—

Mrs. E. M. Gill, Beans	1 00

EXHIBITION OF WINTER FRUITS AND VEGETABLES.

NOVEMBER 17.

PARSNIPS.— Twelve specimens:

First, A. Nixon	3 00
Second, W. Heustis & Son	2 00
Third, George D. Moore	1 00

SALSIFY.— Twelve specimens:

First, George D. Moore	3 00
Second, Warren Heustis & Son	2 00
Third, A. E. Hartshorn	1 00

CUCUMBERS.— Pair:

First, Francis Blake	3 00
Second, E. M. Bruce	2 00
Third, Mrs. John L. Gardner	1 00

CABBAGES.— Three Red, trimmed:

First, A. E. Hartshorn	3 00
Second, Hon. Aaron Low	2 00
Third, Hon. Aaron Low	1 00

Savoy:

First, A. E. Hartshorn	3 00
Second, A. Nixon	1 00

BRUSSELS SPROUTS.— Half-peck :

First, A. E. Hartshorn	3 00
Second, A. E. Hartshorn	2 00
Third, E. S. Converse	1 00

CAULIFLOWERS.— Four specimens :

First, C. M. Handley	3 00
Second, De Souza Brothers	2 00
Third, W. H. Teele	1 00

CELERY.— Four roots :

First, A. Nixon	3 00
Second, Warren Heustis & Son	2 00
Third, W. Warburton	1 00

LETTUCE.— Four heads :

First, J. C. Stone	3 00
Second, George D. Moore	2 00
Third, Varnum Frost	1 00

TOMATOES.— Twelve specimens, grown under glass :

First, W. C. Winter, Essex	3 00
Second, W. C. Winter, Best of All	2 00
Third, W. C. Winter, May's	1 00

Gratuities :—

A. E Hartshorn,	Collection	4 00
E. C. Lewis,	"	2 00
W. Warburton,	"	2 00
A. Nixon,	"	2 00
George D. Moore,	"	2 00
Hon. Aaron Low,	"	1 00
Warren Heustis & Son,	"	1 00

WARREN HOWARD HEUSTIS, *Chairman*,
CEPHAS H. BRACKETT,
VARNUM FROST,
WALTER RUSSELL,
AARON LOW,
GEORGE D. MOORE,
JOSHUA C. STONE,
} *Committee on Vegetables.*

REPORT

OF THE

COMMITTEE ON GARDENS.

FOR THE YEAR 1900.

By PATRICK NORTON, CHAIRMAN.

Your Committee during the past season has been called upon to visit more places than ever before, and it would seem that the competition among the various exhibitors was as unflagging as ever. The unbiassed scrutiny by your Committee of the different methods adopted to attain a certain degree of excellence, is an incentive to parties having estates in charge to excel each other in all their undertakings, and is of the utmost importance to the landscape, the greenhouse, and the garden. The places visited will be treated in rotation in as brief a manner as possible, and at the end of this report we will append a list of our awards.

GEORGE D. MOORE'S LETTUCE HOUSE, ARLINGTON.

The first place for us to visit was George D. Moore's at Arlington, to inspect a house of lettuce. The greenhouse was two hundred and forty feet long by thirty-five feet wide, and contained fourteen thousand four hundred heads of lettuce, of remarkably even growth, very compact, and completely covering the ground. The plants were set eight inches apart all over the house, leaving paths on each side and one in the middle of the house. The lettuce would be in good condition to send to market in a week from the time of our visit.

Dr. Jabez Fisher's New Method of Growing Plants by Sub-Irrigation, Fitchburg.

On the 5th of April we visited Dr. Jabez Fisher, at Fitchburg, to inspect a new method of growing plants of all sorts, by sub-irrigation. This greenhouse was principally devoted to growing tomatoes. The house was one hundred and five feet long by eighteen and one-half feet wide, and contained two hundred and ninety-nine plants of "Sutton's Best of All," very heavily fruited. The first fruit to ripen was one hundred and twenty days from the planting of the seed. Dr. Fisher explains, in the letter which follows, his method of procedure.

Fitchburg, Mass., Aug. 1st., 1900.

To the Committee on Gardens, of the Massachusetts Horticultural Society:

The tomato house to which I have called your attention, is a double span, one hundred and five feet in length, and eighteen and one half feet wide, running north and south, and double glazed. The Committee may be interested to know that the house here described was built in 1860–61, and glazed with old time 10 x 12 glass. It still remains as originally built, and has grown forty-one annual crops of one kind or another. Hot water is the agent used in heating.

A single seed of "Sutton's Best of All" tomato was planted in a three and one-half inch pot at times from October 1st to November 10th, and the pots were set in shallow zinc pans in which was kept at all times about an inch of water. When the plants began to crowd one another they were transferred to their permanent position without disturbing the ball of roots.

The soil was a mixture of half decayed sods and horse manure in equal proportions, put together some months previously, and shovelled over several times during the summer. This soil was placed in bottomless boxes of sheet iron or wood, standing in zinc pans or on cement bottoms, so arranged that water could be supplied to the outsides of the boxes and be taken up by capillary attraction as the plants might require. The moisture was not kept up simply by the supply of water in this way, but actual standing water, averaging an inch in depth, was present during the entire life of the plants. Most of the boxes were twenty-four inches long, eighteen inches wide, and seven inches deep, thus

containing three square feet of surface, and each one held three plants, giving to each plant one square foot. The soil, made up of vegetable matter in large proportion, was placed in the boxes only four inches deep and without the slightest compacting, the object being to keep it as porous and spongy as possible, and no water was ever applied to the surface. The plants were trained to a single stem perpendicularly to the roof, and thence up the roof until they reached others, giving each one from seven to eight feet in length. Each third lateral was allowed to grow and produce a single cluster of fruit, thus doubling the number of clusters on the main stem. There were six rows of plants, and the plants were twenty-one inches apart in the row, the exact number being two hundred and ninety-nine. The first fruit was marketed March 2nd, and the last June 27th. At the time of your visit, which occurred April 5th, there were growing a few geraniums, callas, carnations, and coleuses, all under the same treatment, and although,—except in the case of the coleuses,—the temperature of the house was not suited to this class of plants, you saw their luxurious and healthy appearance.

Twice during the season a single inch of soil was applied as a top dressing, with a quantity of a complete fertilizer added. The whole settled so that the depth at the close did not exceed five inches, or seven hundred and twenty cubic inches to each plant, having a productive capacity of about fifteen pounds of fruit. I have learned that a larger quantity of soil is likely to produce an over-luxuriant growth that is detrimental to the setting of fruit, especially in the deficient sunshine of the short days of winter.

Blossoms were pollenized by the use of the camel's-hair brush and the padded stick alternately, until about the first of April, after which the brush was omitted. The white, healthy roots not only permeated the soil but extended freely into the clear water on all sides, thus showing that the conditions were congenial. The bottom inch of soil was, of course, under water at all times. The soil about that was never dry enough to be friable; on the contrary, it seemed to be so saturated with moisture as to be a mass of mud, and yet it contained sufficient atmospheric air to supply fully all the conditions required by plant life. The fruit was very solid and of fine color, without any show of disease.

JABEZ FISHER.

WILLIAM PROCTOR'S CUCUMBER HOUSE, FITCHBURG.

The third place visited was Mr. William Proctor's, at Fitchburg, on April 5th, to look at a house of cucumbers. The house was one hundred and five feet long by twenty-one feet wide, and had three rows of plants lengthwise of the house and two feet apart in the rows; the seed was planted January 15th. The house was very neat and clean, the plants were very healthy and extremely vigorous and well fruited, and Mr. Proctor was cutting a large quantity of fruit, of a larger and longer growth than the ordinary White Spine, which commanded a ready sale in the market, and made a very fine show. We append Mr. Proctor's letter, showing the splendid results of his method of growing cucumbers.

FITCHBURG, September, 25, 1900.

MR. PATRICK NORTON,

DEAR SIR:—Yours of the 18th is at hand and contents noted. I sowed my seed January 15th and transplanted several times to keep them back, my house not being ready. I always transplant three times, prick them out just as soon as they are thirty-six hours through the ground (in border on strong bottom heat), and twice in pots: first in four inch, then in six, getting strong plants in four weeks from sowing the seed.

I renew part of the soil six inches deep each year; it is composed of half sod and half fresh stable manure, mixed together during the summer. The temperature of the pile is high enough to kill all nematodes; there is no need of sterilizing, and I have never seen any root galls. I planted out the house and entered it for premium March 1st; cut the first cucumbers the 28th of March, and the last July 12th, there still being lots of cucumbers, but I had more than I could sell to good advantage, and I then finished painting my house, not having had time to do it before I set out my crop.

I keep the temperature between sixty and seventy,—not above seventy nor below sixty if I can help it, during the night, and eighty-five during the day (except cloudy days), when I let it rise only a little above the night temperature. I heat water from fifty-five to sixty degrees and use it in abundance, and use bees for pollinating.

I set out the plants on strong bottom heat, opening a trench ten

inches wide and twelve deep, putting in six inches solid of fresh horse manure; and use equal parts of nitrate of soda, sulphate of potash, and dissolved bone black after May first, a little at a time and often.

The house which I entered for cucumbers is one hundred and thirty-five feet long, and twenty feet wide. It contained one hundred and twenty plants (three rows). I have cut not less than eighteen bushels per week since you were here until the 15th of July, two hundred and ninety-eight bushels in all.

You know there is only one secret in business: eternal vigilance,—the man who attends closest generally gets the best results. Yours very truly,

WILLIAM PROCTOR.

M. A. PATTEN'S CARNATION HOUSE, TEWKSBURY.

On April 11th we visited the large greenhouse plant of M. A. Patten, at Tewksbury, to inspect a house of carnations. The house was two hundred and fifty feet long by twenty-one feet wide, built but lately by Lord & Burnham. The house was very neat and clean, and the plants were on benches, and very vigorous and healthy. The stems were nearly two feet long and the flowers very large and highly colored. The numerous kinds included Mme. Joost, White Cloud, G. H. Crane, Mrs. Bradt, Flora Hill, Melba, Maud Adams, and a large number of seedlings.

ESTATE OF C. H. TENNEY, METHUEN.

On the 8th of June your Committee visited the elegant estate of C. H. Tenney, at Methuen, which is entered for the H. H. Hunnewell Triennial Premium. The whole estate, containing eighty acres of land, was in the most perfect order, situated on the top of an uneven hill, splendidly planted with the most expensive trees and shrubs in a judicious manner, and it presented a very beautiful appearance. The coniferæ were of generous size, and planted in such a way as to show each as a specimen tree. The new growth on these enhanced their beauty, and everybody was enthusiastic over their elegance. The groups of large Japan maples were another good feature in the landscape; so also the large beds of rhododendrons, fully in flower, and interspersed with azaleas. The estate was replete with everything that good taste could utilize to make it a sumptuous summer home.

Greycourt, the Estate of C. H. Tenney, Methuen.

Mrs. David Nevins's Estate, Methuen.

On June 20th we visited Mrs. David Nevins, at Methuen, where we were received in a new house adjoining the Memorial Library grounds. It is the intention of Mrs. Nevins to remove this house and put the then vacant land into the Library domain, thereby enlarging those surrouudings. The old homestead, on the opposite side of the street, was being overhauled and repaired, and when transformed would be re-occupied later in the season. The generous hospitality of Mrs. Nevins was repeated on this occasion just the same as was always exercised by the late Mr. Nevins whenever we visited their elegant estate at South Framingham. It was an enjoyable day, long to be remembered.

Warren H. Heustis's Strawberry Garden, Belmont.

The seventh place visited was that of Warren H. Heustis, at Belmont, on the 25th of June, to inspect and sample strawberries. The two parcels consisted of about a half-acre each. The first parcel was the Marshall, and it was wonderfully well fruited with exceedingly large, highly colored berries in very fine condition. Expert growers from Arlington made the statement that it was the best half-acre of strawberries they ever saw, and this was endorsed by your Committee. The other bed was made up of a number of varieties, planted with a view to test their quality and productiveness as compared with the Marshall and Belmont. Mr. Heustis's vegetable garden was in fine condition, and he was sending to market daily very large loads of the choicest kinds, which commanded a ready sale at good prices.

O. B. Hadwen's Estate, Worcester

On July 19th we visited the estate of O. B. Hadwen, at Worcester. The farm consists of about sixty acres of land, and is mostly in grass and fruit. A great many of the apple trees were grown from seed planted by him many years ago. Nearly all the other trees were set out by him and have attained great size; some of them we measured and found them from nine to ten feet in circumference. Many of the trees and shrubs were of unusual rarity and beauty—very choice specimens, not often seen on any place. The planting was not to be com-

mended, as some of the rare trees and shrubs had not room enough to permit them to develop into handsome specimens. In consequence the grounds had rather a crowded appearance, which might have been obviated by giving each shrub or tree plenty of room to develop.

E. S. Converse's Vinery, Malden.

We visited on July 26th the estate of E. S. Converse, at Malden, to inspect a vinery which consisted of a span roof house containing sixteen vines averaging fourteen bunches of grapes to the vine. The fruit was in very large bunches, highly colored, with a fine bloom, and of the first quality. There were several other houses of grapes in all stages of growth and ripening, but our attention was directed to that above described, for the fruit was in the best condition for the table. The place was kept by Mr. D. F. Roy, the gardener, in fine condition, and the judicious arrangement of greenhouse plants about the grounds gave it a sumptuous appearance seldom seen on suburban estates.

Arthur F. Estabrook's Grounds, Beach Bluff.

The tenth visit was to the summer residence of A. F. Estabrook, at Beach Bluff, on August 15th. The Committee was very much pleased with Barberry Lodge, and with the work performed by Mr. Barker, the gardener. The grounds were in fine condition, and the various specimens of "bedding out" were a credit to the gardener. The border of sweet alyssum around the house was very fine and finished off the background of trailing and other plants most completely. The hospitality of Mr. Estabrook was only equalled by the fine appearance of his estate.

The Oliver Ames Estate, North Easton.

On September 7th the Committee visited Mr. Oakes Ames, at North Easton. This estate is entered for the Hunnewell Triennial Premium, and this is the second year of entry. It presented a much finer appearance than last year. The lily ponds were full of water and all the aquatics were in splendid bloom. The greenhouses were full of magnificent plants, and Mr. Ames's experience in crossing species and raising seedlings seemed to be very

The Oliver Ames Estate, North Easton.

successful. It is a great pleasure to visit a place where the owner is so deeply interested in everything pertaining to the beautifying of nature.

Lothrop & Higgins's Dahlia Gardens, East Bridgewater.

The twelfth visit this year was made to the dahlia gardens of Lothrop & Higgins, at East Bridgewater. These consisted of four acres, where over four hundred kinds of the best varieties procurable were grown. The display was very fine and well worthy of the visit. Generous culture and dwarf plants, requiring no stakes, were prominent features to be commended. Some of the cactus varieties were remarkable both for color and shape. One variety was grown more particularly for its beautiful fern-like foliage, for cutting to place with the flowers of the more formal varieties.

Col. Frederick Mason's Vegetable Garden, Taunton.

September 13th a visit was made to Taunton to inspect the vegetable garden of Col. Frederick Mason. The gardener, Mr. E. C. Lewis, complained of a very dry season and that the crops suffered in consequence, but your Committee did not discover any deficiency in moisture on the whole farm, every crop being in a high state of productiveness. We noticed that he uses a large quantity of ashes and nitrate of soda, and these may, in a measure, account for the unusual good quality of his crops. Thorough cultivation was another feature to be commended. On the whole farm we saw no weeds, for the farmer told us that it was easier to grow crops of vegetables than of weeds. We were much pleased with our visit to this place.

Col. Charles Pfaff's Chrysanthemum House, South Framingham.

The fourteenth visit was to the elegant estate of Col. Charles Pfaff, at South Framingham, to inspect a house of chrysanthemums grown on benches. The house was eighty-five feet long by twenty-one feet wide, and contained six hundred plants in seventy-five varieties, and it presented a splendid appearance.

The plants were grown to one flower each, were of very sturdy growth, well covered with massive foliage from the bloom down to the earth in the bench, and crowned with enormous flowers. In fact it was a splendid sight to behold, and reflected great credit on the gardener, Mr. George Melvin, for his skill in growing the "Golden Queen of Autumn."

Mrs. A. W. Spencer's Chrysanthemum House, South Framingham.

On November 1st your Committee visited the estate of Mrs. A. W. Spencer to inspect a house of Chrysanthemums grown on benches. The house contained eight hundred plants of sixty-two varieties and this was the first crop of any kind ever grown in it. Mr. Alexander McKay, gardener to the late David Nevins, has charge of the place, and from the superb exhibition he made we know that his right hand has not forgotten its cunning in growing this superb flower.

We are glad to know that Mrs. Spencer has secured the services of so good an "all round" man in the cultivation of her estate.

Mrs. B. P. Cheney's Chrysanthemum House, Wellesley.

On November 2nd we visited the estate of Mrs. B. P. Cheney, at Wellesley, to inspect a house of chrysanthemums arranged for effect with other decorative plants. This house is particularly adapted for such an arrangement, and the gardener, John Barr, has the good taste to take advantage of the situation to make the house "a thing of beauty" and the recollection of it "a joy forever" to everyone who saw it. The plants were grand, averaging fully six feet in diameter, well flowered and extremely well trained. The arrangement of the house with regard to colors was very fine, particularly so as plenty of decorative foliage plants were freely used to enhance the beautiful display of color in the chrysanthemums. The house was seventy-five feet long by twenty-five feet wide, and twenty-eight plants filled the house. We append the gardener's report.

South Natick, November 23rd, 1900.

Mr. Patrick Norton.

Dear Sir:—We propagated sixty-five plants in November, 1899, in forty-five varieties; as soon as rooted, potted into two and

a half inch pots, and shifted along into four inch, and so on as they required it. About the first of June they got the final shift into twelve inch pots. During the summer we discarded such varieties as did not seem suitable for that way of growing; we finished twenty-eight plants and they filled one house twenty feet by seventy. I pinch every second leaf from the time they are rooted till the middle of July; it must be done regularly to get a well balanced specimen. In potting I use a mixture of sod, loam, old cow manure, and a good share of bone flour; we allow the flowering pots to be well filled with roots before we start feeding, and for the last two years I have used Imperial Liquid Food for that purpose entirely, applying it twice a week and increasing the strength as the plants required it; as the plants commence to show color I gradually withhold it. Hoping you are well,

Yours truly,

JOHN BARR.

List of names of specimens:

Arethusa,
Black Hawk,
Dr. Hope,
Edith Smith,
Georgiana Pitcher,
Georgienne Bramhall,
Golden Trophy,
Kate Broomhead,
Lady Hanham,
Lady Isabel,
Louis Boehmer (two plants),
Marion Henderson,
Mongolian Prince,
Mrs. E. B. Freeman,
Mrs. F. A. Constable,
Mrs. H. Weeks,
Mrs. J. G. Breer,
Mrs. J. Lewis,
Mrs. N. Molineaux,
Mutual Friend,
Peter Kay,
Phoebus,
Red Warrior,
Savannah,
Shilowa,
Silver Cloud,
The Bard.

EDWARD HATCH'S ESTATE, WENHAM.

On the third of November the Committee visited "The Windmill," the hospitable abode of Edward Hatch, Esq., situated on Lake Wenham. Mr. Hatch's aim is so to beautify this place by the judicious planting of trees and shrubs as to make it pleasant and agreeable to his numerous friends when they visit him in his

own domain. The house is prettily placed on an eminence overlooking Lake Wenham, one of the most picturesque bodies of water in this section of the country, where sailing and fishing are enjoyed by all the lovers of those sports. Thirty-five new trees were planted this Fall, and the advice of this Committee will be taken in all future operations.

EDMUND M. WOOD & CO.'S WABAN ROSE HOUSES, NATICK.

The last visit made this year was on the 15th. of November to the Waban rose houses of Edmund M. Wood & Co., at Natick. Our object was to inspect a house of roses. The house was three hundred and fifty-five feet long by twenty feet wide, and contained about twenty-five hundred plants, which were planted in solid beds on June 29th last. The plants were very vigorous, remarkably healthy, and splendidly flowered, and consisted of Brides and Bridesmaids with very large well finished blooms. The other houses were in the same good condition, and reflected great credit on Mr. Alexander Montgomery, who has charge of the whole plant. Two new houses, erected this summer, each seven hundred feet long, were planted to American Beauty and Liberty roses, and were well worth looking at, as they are the longest houses ever visited by your Committee.

The prizes awarded this year are as follows:

Special Prize from the John A. Lowell Fund:

For the best House of Chrysanthemums grown on benches:
First, Mrs. A. W. Spencer $30 00

Society's Prizes.

For the best House of Roses:
First, E. M. Wood & Co. 30 00
For the best House of Carnations:
First, M. A. Patten 30 00
For the best House of Foreign Grapes:
First, E. S. Converse 30 00
For the best Strawberry Garden:
First, W. H. Heustis 30 00
For the best House of Cucumbers:
First, William Proctor 30 00

For the best House of Lettuce:	
First, George D. Moore	30 00
For the best Vegetable Garden:	
First, W. H. Heustis	30 00

Gratuities.

Mrs. B. P. Cheney, House of Chrysanthemums grown on benches	20 00
Lothrop & Higgins, Dahlia Garden	25 00
Dr. Jabez Fisher, House of Tomatoes, grown by sub-irrigation .	30 00
Arthur F. Estabrook, Estate	25 00
O. B Hadwen, "	25 00
Edward Hatch, "	25 00
Mrs. David Nevins, "	25 00
Col. Charles Pfaff, Chrysanthemums on benches . .	Silver Gilt Medal.
Mrs. B. P. Cheney, House of Chrysanthemums in pots, arranged for effect	Silver Gilt Medal.
Col. Frederick Mason, Vegetable Garden . . .	Silver Gilt Medal.

Respectfully submitted,

PATRICK NORTON, Boston, *Chairman*,
WILLIAM WALLACE LUNT,
J. WOODWARD MANNING,
E. W. WOOD,
WARREN HOWARD HEUSTIS,
JOSEPH H. WOODFORD,
JACKSON T. DAWSON,
HENRY W. WILSON,
} *Committee on Gardens.*

REPORT

OF THE

Committee on School Gardens and Children's Herbariums.

FOR THE YEAR 1900.

By HENRY LINCOLN CLAPP, CHAIRMAN.

In the spring of 1900 a kitchen garden was established on the grounds of the George Putnam School, Roxbury, for reasons that have long been understood and appreciated by various authorities, educational, horticultural, and agricultural, in Europe.

No influence, encouragement, or financial aid of any society, or coterie of interested neighbors was concerned in its establishment. The first suggestion of using the land for a garden came from the Superintendent of Schools, Mr. E. P. Seaver. The model for planning and managing it came from Germany. There are no models of complete school gardens in this country.

The local preacher, Rev. Seth Carey, observed the children at work in the garden, back of his residence, and came to the conclusion that the enterprise contained a lesson important enough to warrant him in devoting a part of his Sunday sermon to its presentation. Garden work would keep children off the streets, cultivate habits of industry and respect for other people's gardens, improve their observational powers, give them a love for plant growth, incline them to better manners and morals, and turn their attention towards the blessings of outdoor life as an offset to the strong current toward shop life.

FIG. 1.

Straightening and planting the beds.

A piece of rough, grassy land, four rods square, was ploughed by a friend free of charge; the director of the garden paid for manuring it, eighty-four pupils made eighty-four beds, each ten feet long and three and a half feet wide, and surrounded them on all sides with walks fourteen inches wide, and bought tools, seeds, and plants for carrying out their work.

The size of the beds is about the same as that of the beds given to school children in Germany. The width of a bed is such that the young gardener can easily reach every part of it with his hand.

The formation of the beds according to lines carefully determined was a good lesson in simple plotting; but owing to the roughness of the land many measurements had to be repeated before the beds and paths could be exactly located.

Directions for planting different kinds of seeds were given to the pupils in their class rooms. Some seeds were to be planted in hills, some in drills, some barely covered with earth as in the case of very fine seeds, some with more earth as in the case of corn, beans, and potatoes. Nevertheless a good many mistakes were made in planting, as shown later when the young plants came up.

FIG. 2.

Weeding and watering.

The carrots, parsnips, beets, and cabbage and lettuce plants were very thick, and the necessity for transplanting was plain when the matted plants refused to increase in size, while those that came from single scattered seeds increased in size rapidly.

The various modes of plant growth were very interesting to the children. Since they worked in the garden only once a week, on Monday in the afternoon, some changes in the plants during the week excited surprise. The appearance of the bean plants produced consternation. There was a suspicion which almost amounted to a certainty that some one had been pulling up the beans and setting them out again. A week before they were certainly under the ground and now they were above it. The children's wrath was appeased when they were told that that was the bean's way of growing. The skin of the onion seed at the end of the grass-like shoot, the tap roots of carrots, parsnips, etc., the strong spreading roots of corn plants, and many other variations in plant growth were carefully observed.

The transplanting was attended with many failures on account of the great disturbance of the roots of the plants. One girl jerked up her bean plants with her right hand and transferred them to

FIG. 3.

Visit of the Normal School pupils.

her left till she had a large bunch and then put them into the earth as if they had been so many lifeless sticks. Although she deluged them with water, she wondered why they did not grow. They simply turned yellow and vanished. The sowing and the reaping and the care between were full of lessons of failure and success, of observation and comparison, which were of great educational value. The children could hardly wait for the garden day to come. The sun was hot, the weeds made excellent progress during the week, and the work was often hard for inexperienced workers; but interest never seemed to flag.

Flowering plants as well as vegetables were planted in some beds, and both kinds were taken home a number of times during the summer. Raw peanuts were planted and the production of new peanuts was a constant source of interest to the children. Vegetable roots, such as beets, various kinds of turnips, carrots, etc., were planted and allowed to flower and go to seed. The big roots dwindled away in proportion as they put their life into the part of the plant above ground for the production of seed.

The pupils of the Boston Normal School visited the garden three times during the season to observe the children at work.

The children who left the city during the long summer vacation found their beds overgrown with weeds when they returned at the opening of the school. About half the beds had to be reassigned on account of promotions from the seventh grade, the children

FIG. 4.

Weeds when the school opened, Sept. 12.

who have gardens being confined to that grade. Weeding was the main business for a time; then the beds were put in shape and planted with bulbs — tulips, crocuses, hyacinths, etc., which the children bought. So next spring they will have flowers a good deal earlier than they did last spring.

Among all the schemes for manual training in this country, there is not one that is carried on by means of outdoor work; all rely on indoor work. In Europe the method is quite different. It certainly has a wider range and seems more suitable for children, taking the year through. During the warm season manual training is carried on out of doors in school gardens; but during the cold season Sloyd, carving, and other forms of indoor work are carried on. In this way all pupils have fine opportunities for sharpening their powers of observation by studying plants under competent direction. The school children in this country do not have that advantage.

The Committee wish to direct the attention of educators, horticulturists, and agriculturists to the great educational, æsthetic, and economic value of school garden work by means of this report, pictures, description, statistics, and all, and to suggest the great

FIG. 5.

Weeding contest between boys and girls.

opportunity presented to a society like this, for instance, to encourage and extend such work, of which so much is done in Europe and so little in this country. It is worth while to consider seriously what educators, horticulturists, and agriculturists in Europe think of school gardens, and what they have done to put their ideas into practice. If the consideration should result in the Society's taking an active part in establishing gardens on school premises, and should enlist the aid of the Massachusetts State Board of Education to the same end, the cause of education, horticulture, and agriculture would be advanced, if we may judge from what Europeans engaged in similar occupations have done.

Austria-Hungary, the most favored place for school gardens, has eighteen thousand; Sweden in 1899 had four thousand six hundred and seventy; all public elementary schools in Belgium have gardens, each at least thirty-nine and one-half square rods in area; model school gardens are connected with five normal schools and many elementary schools in Switzerland; model school gardens are connected with the normal schools in six cities of France, and no plan of a school building in the country to which the State contributes is accepted unless a garden is attached;

FIG. 6.

Bulb planting, Nov. 15.

middle and southern Russia have many school gardens, those in one province alone occupying two hundred and ninety-six and one half acres of land; in Germany many a large city has a central school garden which supplies thousands of cuttings for the use of schools; Magdeburg has such a garden containing nearly sixty-two acres, Leipsic three acres, Breslau, Mannheim, Dortmund, and Cologne, each five acres, and other cities, far too numerous to mention, have gardens of less area.

The statements made concerning the Massachusetts Horticultural Society, in 1829, seventy years ago, are just as applicable now concerning the establishment of school gardens. Judge Buel of Albany wrote a letter to the editor of the "New England Farmer" and in it said: "There is more talent in Boston and vicinity for such an association than in any other place in the United States." In the "New England Farmer" of January 9, 1829, a letter was published, the writer of which said "Whatever has a tendency to promote this honorable, useful, and independent branch of domestic industry, should be fostered and regarded. . . .

The citizens of Massachusetts have never been backward in promoting any object of public utility; and it is believed that all that is now wanting to give an impulse to the plan here suggested is to present the subject to the consideration of your readers. New York, Philadelphia, and some other of our sister cities have preceded us in the good work. Let us go and do likewise." To make these statements perfectly applicable to the establishment of school gardens we have simply to change the last statement thus: Most European countries have preceded us in the good work from twenty to forty years. Let us follow their example.

MEDFORD SCHOOL GARDENS.

The gardens at the Swan and Curtis Schools have been kept up to their usual excellence during the past year, and have furnished the classes with much of the material for their nature lessons. As the pupils of these schools are all of primary grades (grades I to III) it has not been considered wise to introduce any greater variety of plants than are now in the garden. The care and study of these are sufficient for such young people, the ages ranging from five to nine years.

The Brooks School made a beginning on its garden the past year, and the pupils were enthusiastic to get it well stocked with wild flowers. As this was the first season, it is not wise to attempt to give a list of the specimens introduced, as many will not survive the winter. A large number of Asters and Goldenrods and several Lactucas have evidently found a permanent home in this garden, having been planted in the fall of 1899. The garden runs the whole length of the back line of the school lot, which is upwards of three hundred feet, and each schoolroom has its allotted portion in which to cultivate the representatives of the families of plants that are included in the nature study of the grade. The fern garden was begun in the season of 1899, and has now a good list of species. The following have been successfully established:

Polypodium vulgare.
Adiantum pedatum.
Pteris aquilina.
Asplenium Trichomanes (in schoolroom).
Asplenium bulbiferum (in schoolroom).
" *thelypteroides.*
" *Felix-fœmina.*

Camptosorus rhizophyllus (in schoolroom).
Phegopteris polypodiodes.
" *hexagonoptera.*
" *Dryopteris.*
Aspidium Noveboracense.
" *spinulosum* var. *intermedium.*
" *cristatum.*
" " var. *Goldianum.*
Aspidium marginale.
" *acrostichoides.*
Cystopteris bulbifera.
" *fragilis.*
Onoclea sensibilis.
" *Struthiopteris.*
Woodsia Ilvensis.
Osmunda regalis.
" *Claytoniana.*
" *cinnamomea.*
Botrychium ternatum.

SCHOOL GARDEN AT BATH, MAINE.

This garden which was started in 1896, has now forty-three flowering plants and fifteen ferns. The following plants were added during the season of 1900:

Coptis trifolia.
Viola pedata.
Amphicarpæa monoica.
Streptopus roseus.

Viola Canadensis, a small root in 1896, has borne unusually large flowers on very long stems, and has spread so that it now covers a space four and one half feet by five feet.

Aster longifolius has produced many pink flowers of large size, some of them an inch and a half in diameter. The Solomon's Seal has also made wonderful growth since it was put in, in 1897.

Solidago juncea formed this year a very beautiful, graceful clump, nearly twice the size of the plant when put in the year before.

Some of the girls studied the flowers and ferns as they came forward in the spring, drawing them in the different stages, noting dates and characteristics.

LOUISVILLE, KY., SCHOOL GARDEN.

REPORT BY EMILIE YUNKER.

LOUISVILLE NORMAL SCHOOL.

We started a flower garden on a small scale in our school yard last year. But we secured a larger garden space in a neighbor's back yard in the vicinity of our school, through the kindness of Joe Mitchell Lavielle's mother.

Eleven boys and girls, averaging seven and a half years of age, formed the Gardeners' Club. They planted such rapid growing plants as white hyacinth bean, purple flowering bean, balsam, zinnia, cotton, radishes, carrots, beets, tomatoes, lettuce, and popcorn, of which we popped a grape basket full one day in the fall, in Mrs. Lavielle's back yard to which I have referred. The children received much interest and useful instruction from the work which they did, and we have been promised twice as much space this coming year.

CONCERNING SCHOOL GARDENS ELSEWHERE.

Mr. H. H. Longsdorf of Camp Hill, Pa., has been commissioned to prepare a bulletin on "Consolidation of Rural Schools in Pennsylvania." Fortunately he learned of the school garden movement under the auspices of the Society, wrote me to have a halftone cut of children at work in a school garden made for him to illustrate his bulletin, and sent a check for two dollars and a half to pay the cost of the cut. He probably received the cut at the end of the third day after his order was received.

In his letter he says: "I was captivated by the idea of the school garden feature and thought it applied to conditions in this State. Strange it has never been experimented upon, or even mentioned, where land is so abundant. We intend to work up the school garden in this State. You will see I have copiously quoted from your article (Popular Science Monthly, Feb., 1898), and acknowledged my indebtedness to you in my letter of transmittal to the Secretary of Agriculture of this state."

Mr. W. H. Moulton, Secretary of the Industrial Committee of the Cleveland, Ohio, Chamber of Commerce, is much interested in cultivating in children a love for plants, and in one of his letters says: "In regard to our work here I would state that some money has been contributed to experiment with one of our down-town school grounds, and we shall endeavor to make during the coming summer all that we can out of it.

Last year forty thousand packages of flower seeds were distributed to the school children, who paid for them one cent each. This year, from time to time, we shall address the school children on this subject, and wish to get as complete a list of slides as possible—slides of school grounds, scholars at work, vines, shrubbery,

and flowers. We wish to be advised as to whether we can obtain the photographs of which you speak, from which we can have slides made, and if so, we will remit for them on receipt of your advice as to their cost. We shall be pleased to send you the report on the distribution of seeds last year as soon as it is received from the printer."

CHILDREN'S HERBARIUMS.

Concerning the exhibition of children's herbariums a person was heard to ask, "What's the use of studying them dried things?" Evidently more light is needed in respect to the connection of herbarium work with the proper work of this Society or any other horticultural society. The light should come from this library of ten thousand volumes, more or less. Undoubtedly there are persons whom this library cannot illuminate; but a suggestion may do some good. More than half the authors of these books studied "them dried things," and thereby were enabled to write their books. The names of Linnæus, De Candolle, Jacob Bigelow, and Asa Gray will live when our names are forgotten. Professors Goodale, Robinson, Thaxter, and Fernald of Harvard College can tell the use of studying "them dried things". Walter Deane has collected thirty-five thousand of "them dried things," and in doing it has won a national reputation as a botanist. Thousands of professors of botany in colleges and scientific societies all over the world have studied "them dried things," and by so doing have obtained education, reputation, happiness, and a good living. No one can expect to get more by raising cabbages and onions, apples and pears, roses and chrysanthemums.

The good thing about the whole work is that "them dried things" are first-hand evidence that they have been and will be studied as living things. The influence goes through the life. It is probable that children who become interested in plants, living or dried, will continue to study them in adult life.

Arthur C. Faxon, who exhibited plants in this hall up to the age limit, studied rare plants last summer in Randolph, N. H. Miss Lucy D. Ellis, who won the first Davenport prize of fifty native ferns in 1897, is now a pupil in the Boston Normal School, preparing to be a teacher. She has been invited to give a talk on ferns before the teachers and pupils of the Normal School. John

Murdoch, Jr., who had an unusually large collection at the last exhibition, found a very rare plant, *Cycloloma platyphyllum*, in Orleans, Mass., last summer, an account of which was published in "Rhodora" by the New England Botanical Club. Its ordinary range is from Manitoba westward and southward.

A new and especially interesting feature of the exhibition was found in a large collection of strange seeds gathered by Mrs. H.L. T. Wolcott on her journeys to the South, the Bermudas, California, the Sandwich Islands, and other places. Some were remarkable in shape, others in color, and all were especially interesting to those who knew by actual experience how and where they grew. Most of the names would give the reader, though acquainted with the flora of all New England, no idea of value.

However, there were in the collection seeds of many trees and plants whose names are not infrequently mentioned in school geographies and books of travel, such as acacia (six kinds), banyan, Barbadoes cherry, *Bixa Orellana* (dye called *annotto* is made from the seeds and used in coloring butter and cheese), sweet and sour sop, cassia (seeds packed in like a roll of lozenges and partitions of pods used in preparing chewing tobacco), calabash (used for bowls), eucalyptus of several kinds (from Australia), india rubber, litchi (commonly given away by Chinese laundrymen), mesquite (from Colorado desert), mango (delicious fruit), pomegranate, persimmon, royal palm, Madagascar palm, sugar palm, betel palm, date palm, jaggery palm, morning-glory (from Africa, the seeds when steeped in water are an antidote for snake bites), pecan, guava (excellent fruit, used for jelly), lobed oak (three thousand feet up Mount Lowe), ginkgo (Japan), water chestnut (from China, now in Concord River), and tamarind (used for invalids).

All day there was an interested company looking at the collection and listening to Mrs. Wolcott's desription of the seeds and the trees and plants which produced them.

PRIZES AND GRATUITIES AWARDED FOR SCHOOL GARDENS AND CHILDREN'S HERBARIUMS.

SCHOOL GARDENS.

George Putnam School, Roxbury, first prize	$15 00
High School, Bath, Maine, second prize	12 00

CHILDREN'S HERBARIUMS.

FLOWERING PLANTS.— For fifty specimens:

First prize, Edward L. Morse	2 00
Second, C. Davis Swain	1 50

Gratuities:—

John Murdoch, Jr., for one hundred and ninety-nine additions	5 00
Joseph Murdoch, for one hundred and forty-two additions	4 00
L. B. McLaughlin, for one hundred and twenty-five additions	2 50
Richard Murdoch, for one hundred additions	3 00
Ruth Robinson, for sixty-four additions	3 25
Helen Robinson, for fifty additions	3 00
Robert D. Morse, for fifty additions	2 50
Philip Morse, for fifty additions	2 50
Winthrop Swain, for fifty additions	2 00
Marion L. French, for forty-one additions	1 75
Olive L. French, for thirty-eight additions	2 75
Bessie R. Parmenter, for thirty-four additions	2 25

FERNS.— For thirty specimens:

First prize, Cristine Dudley Clapp	5 00
Second, Edith A. Cumberland	4 00
For twenty specimens:	
First prize, Bertha Wood	3 50
Second, Maud L. Barnes	3 00
For fifteen specimens:	
Second prize, Joseph Murdoch	3 00
For ten specimens:	
First prize, Edith M. Butcher	2 00
Second, Grace M. H. Stack	1 00
For five specimens:	
First prize, Bessie R. Parmenter	75
Second, Henry Rothenburg	50

Gratuity:—

John Murdoch, Jr., for six additions	50

SEDGES.

Gratuities:—

John Murdoch, Jr., for twenty-five additions	2 00
Olive L. French, for ten additions	1 25

GRASSES.

Gratuities:

John Murdoch, Jr., for twenty additions	2 00
John Murdoch, Jr., for miscellaneous collections	50

SCHOOL HERBARIUMS.

For the best Herbarium of seven classes:		
Second prize, Franklin Primary School, Holbrook		6 00
Total for Gardens and Herbariums		$100 00

The amount of money appropriated by the Society for the use of of the Committee was:

For Prizes and Gratuities	$125 00		
For Current Expenses	75 00		
		200 00	
Received from sales of paper		16 55	
			$216 55
Awarded for School Gardens		$27 00	
Awarded for Herbariums		73 00	
Printing		21 00	
Paper		15 92	
Advertising		5 60	
Expressage, posters, stamping, etc.		10 00	
Postage, wrappers, etc.		1 95	
Total Expense			154 47
Balance unexpended			$62 08

HENRY L. CLAPP, *Chairman*, Roxbury,
MISS KATHARINE W. HUSTON, Roxbury,
WILLIAM P. RICH, Chelsea,
CHARLES W. JENKS, Bedford,
MRS. H. L. T. WOLCOTT, Dedham,
HENRY S. ADAMS, Dorchester,
W. E. C. RICH, *Secretary*,
99 Moreland Street, Roxbury, Mass.

Committee on School Gardens and Children's Herbariums.

REPORT

OF THE

COMMITTEE ON NATIVE PLANTS.

By Henry Lincoln Clapp.

The members of the Committee on Native Plants have no sympathy with the struggle for money prizes, but aim simply to do good service to others, especially children, that in itself being a sufficient reward. No member of the Committee has ever profited one cent in money by ten years' work, or less, in interesting children in native plants and the growth of plants in general. Money won by gardens has been spent on the same gardens, the benefits of which have been distributed among many children. Money has been awarded for herbariums as economically as if it had been the personal property of the Committee.

The Committee on School Gardens and Children's Herbariums took up the work concerning the exhibition of native plants with some reluctance, because it was not children's work, for which the Committee was brought into being, and the members, who had for years been responsible for the work and had done it, were teachers who invariably left the state during the long summer vacations, and who could not reasonably be expected to judge exhibits of native plants Saturdays. However, with the understanding that the educational, and not the money side of the work should be kept uppermost, the Committee as a whole became responsible for the work, nearly all of which had been done in an excellent manner by the two members who have been appointed recently and could judge the exhibits, Messrs. Jenks and Adams.

That the exhibitors might have in view some points which make for an attractive and instructive display of native plants, the Committee have recommended the use of score cards including the following points and their relative value:

1. (25 points) Completeness of specimens (typical leaves of asters, cleistogamous flowers, radical leaves, and other characteristic parts).

2. (25 points) Educational value (species of the same genus, varieties of the same species, etc., for the purpose of comparison; a number of pyrolas, roses, viburnums and other flowers blossoming at the same time).

3. (20 points) Rarity of specimens.

4. (10 points) Freshness (not wilted or dried).

5. (10 points) Neatness (no dead leaves, cobwebs, slime, straggling branches, etc.).

6. (10 points) Color arrangement (avoid blue and purple, scarlet and lake reds, etc., in juxtaposition).

More than three specimens of a single species will disqualify the bottle in proportion to the excess. This restriction seems necessary for the preservation of rare wild flowers, which are becoming rarer, large masses of which have been used to make a fine display. Three typical specimens tell as much as a larger number.

The exhibits of native plants were fine all through the season and attracted the attention of botanists and those who wish to know wild flowers. The number of exhibitors also made the native plant exhibitions notable for their size and quality. Some of the collections which did not receive prizes were well worthy of them; but only three prizes were offered and won, and all meritorious collections, except the best three, received nothing. It is hoped that the new distribution of the money for premiums will prove more serviceable. Five prizes instead of three will enable more exhibitors to win a prize. It is hoped that the diminished money value of the premiums will not impair the character of the exhibitions. If it does, the inference will be that the desire for money is greater than the desire to interest and instruct the many visitors that are always seen studying the native plants on exhibition.

PRIZES AND GRATUITIES AWARDED FOR NATIVE PLANTS.

1900.

MAY 5.

NATIVE PLANTS.—Collection of thirty bottles of named species and varieties, one bottle of each:

First, Miss Alice L. Grinnell	$8 00
Second, Mrs. W. S. Eager	6 00
Third, Miss Genevieve Doran	4 00

MAY 12.

Gratuity:—

Miss Alice L. Grinnell	1 00

MAY 19.

Gratuity:—

Misses Eleanor A. and Mollie S. Doran	1 00

MAY 26.

Gratuity:—

Miss Alice L. Grinnell	2 00

JUNE 2.

Gratuity:—

Miss Genevieve Doran	2 00

JUNE 12 AND 13, (postponed from JUNE 6 AND 7).

NATIVE PLANTS.—Collection of thirty bottles of named species and varieties, one bottle of each:

First, Miss Alice L. Grinnell	8 00
Second, Mrs. W. S. Eager	6 00
Third, Misses Eleanor A. and Mollie S. Doran	4 00

JUNE 16.

CULTIVATED NATIVE PLANTS.— Collection of species and varieties not common to cultivation:

First, Miss Edith Noyes	4 00
Second, Arthur Clark	3 00

JUNE 23.

Gratuity:—

Miss Alice L. Grinnell	2 00

JUNE 30.

Gratuity:—

Miss Edith Noyes	1 00

JULY 7.

NATIVE PLANTS.— Collection not exceeding forty bottles of named species and varieties, one bottle of each:

First, Miss Alice L. Grinnell	8 00
Second, Miss Edith Noyes	6 00
Third, Carl Blomberg	4 00

JULY 14.

NATIVE FERNS.— Collection of named species and varieties:

First, Carl Blomberg	6 00
Second, Miss Alice L. Grinnell	5 00
Third, Chester C. Kingman	4 00

CULTIVATED NATIVE PLANTS.—Collection of species and varieties not common to cultivation:

First, Miss Edith Noyes	4 00
Second, Arthur Clark	3 00

JULY 21.

Gratuity:—

Misses Eleanor A. and Mollie S. Doran	2 00

JULY 28.

NATIVE PLANTS.— Collection not exceeding forty bottles of named species and varieties, one bottle of each:

First, Carl Blomberg	8 00
Second, Miss Alice L. Grinnell	6 00
Third, Mrs. W. S. Eager	4 00

AUGUST 4.

Gratuities:—

Miss Alice L. Grinnell	3 00
Miss Genevieve Doran	1 00

AUGUST 11.

CULTIVATED NATIVE PLANTS.—Collection of species and varieties not common to cultivation:

Second, Arthur Clark	3 00

Gratuity:—

Miss Alice L. Grinnell	2 00

AUGUST 18.

Gratuity:—

Misses Eleanor A. and Mollie S. Doran	1 00

AUGUST 25.

Gratuities:—

Miss Alice L. Grinnell	2 00
Misses Eleanor A. and Mollie S. Doran	1 00

SEPTEMBER 5.

NATIVE PLANTS.— Collection of forty bottles of named species and varieties, one bottle of each:

First, Miss Alice L. Grinnell	8 00
Second, Carl Blomberg	6 00
Third, Misses Eleanor A. and Mollie S. Doran	4 00

OCTOBER 6.

Gratuity:—

Misses Eleanor A. and Mollie S. Doran	2 00

APPLETON SILVER MEDAL.

Miss Alice L. Grinnell, she having taken four first prizes for Native Plants.

APPLETON BRONZE MEDALS.

Carl Blomberg, he having taken the next greatest number of first prizes for Native Plants.

Miss Edith Noyes, she having taken two first prizes for Cultivated Native Plants.

Estimated cost of Medals	$14 00
Amount appropriated for the use of the Committee	186 50
Amount of Prizes, Gratuities, and Medals	159 00
Balance unexpended	$27 50

REPORT

OF THE

Committee on Forestry and Roadside Improvement,

FOR THE YEAR 1900.

By HARVEY N. SHEPARD, CHAIRMAN.

The Committee on Forestry and Roadside Improvement respectfully report that during the year it has proceeded with the work previously begun relative to roadside trees, and, largely by means of its circulars of inquiry, has increased the replies of information from one hundred and twenty-five cities and towns of the Commonwealth, the number stated in its report of last year, to two hundred and twenty-five. The collation of this information is under way, and involves the mapping of the results of inquiries regarding the distribution of species and the consideration thereof from the point of view of life zones. This part of our work has come to the attention of Dr. C. Hart Merriam, Chief of the Division of Biological Survey, United States Department of Agriculture, who considers it to be of much scientific value and looks for the results of our investigation as likely to be of service in the general transcontinental work of his division.

The interest in roadside trees, to which we referred previously, continues, and the Committee has been brought into sympathetic touch with men and women throughout the Commonwealth who are interested in roadside improvement and are waiting anxiously the help which this Society can give. The correspondence required during the year, in keeping in touch with these people and others

in the same relation and by responding to their inquiries and requests for help in matters of information and advice, has been considerably more than last year, and has been of far reaching value in furthering the preservation and improvement of our roadside trees. The State Highway Commission welcomes our help in this respect. The two societies which today are doing the most to instruct and organize in these matters are the Massachusetts Forestry Association and our Society, and it is gratifying to be able to state that the workers in both societies are in cordial and sympathetic relation. The credit for this portion of our work is due almost entirely to the Secretary of the Committee, Mr. James Sturgis Pray.

We have begun upon another branch of our work in an endeavor to ascertain the economic value of wood planting in the Commonwealth, and trust to be able during the year to make a report relative thereto.

One of the duties confided to the Committee by the vote of the Society appointing its members, is the giving of information of the laws of the Commonwealth relative to forests and trees. In order that we might act intelligently upon this portion of our work, and also because such a compilation may be of value generally, we have made an examination of all the statutes of the Commonwealth relative to forests and trees, and have made a compilation thereof, which now is submitted to the Society, with our recommendation that it be printed in the form of a pamphlet for general distribution.

For the Committee,

HARVEY N. SHEPARD,
Chairman.

REPORT

OF THE

COMMITTEE OF ARRANGEMENTS,

FOR THE YEAR 1900.

By JOSEPH H. WOODFORD, CHAIRMAN.

As the last year of the Century draws to a close, we are glad to look back with satisfaction at the work performed by your Committee in the limited quarters at our disposal. The scheduled exhibitions have been generally very full and at times we have had difficulty in finding space for exhibitors to display their exhibits in a proper manner.

However, we now see in the near future the completion of our new hall where almost unlimited space will be at the disposal of all persons wishing to compete for the very liberal prizes offered by our Society.

The two exhibitions at which an admittance fee was charged were only fairly attended and the result was about the same as last year. The amounts received are appended at the end of this report.

The daily press have been vigilant in their reports of our exhibitions, and we are under obligations to them for such copious reports as have from time to time appeared in their columns. We are also under obligations to the numerous gardeners for the unflagging interest they display at the shows, and we try to make it interesting and attractive for them by the expenditure of the greater portion of the fund voted each year by our Society for extraordinary expenses of your Committee for their benefit.

By the unanimous vote or your Committee, the opening of the new Horticultural Building by a grand exhibition has been placed in competent hands, and we may expect early at the beginning of the new Century an exhibition of unusual magnificence.

Receipts at the Spring Show	$272 50
Receipts at the Chrysanthemum Show . . .	719 75
Total	$992 25

All of which is respectfully submitted,

J. H. Woodford,
William Wallace Lunt,
J. Woodward Manning,
E. W. Wood,
Warren Howard Heustis,
Patrick Norton,
Robert Farquhar,

Committee of Arrangements.

REPORT OF DELEGATE

TO THE

STATE BOARD OF AGRICULTURE,

FOR THE YEAR 1900.

As a new member of the Board, your delegate was assigned to the Committee on Experiments and Station work, and has twice visited the Station at Amherst, in June, and in September (when the crops were more fully developed), and examined the work of the Agricultural and Horticultural Departments under Professors Brooks and Maynard.

The experiments of Prof. Brooks with various fertilizers in combination on corn, potatoes, and other vegetables are very interesting and suggestive, and a very important study for cultivators, so many difficulties existing in the path of him who works against the obstacles which Nature interposes, may be quite smoothed away by understanding these chemical principles. Your delegate saw also the application of various manures for grass land, and the marked results from it; and the very successful work in the crop of clover (sown in midsummer) growing between the rows of ensilage corn.

Prof. Maynard, in the fruit department, furnished an object lesson for cultivators to judge by comparison what are the varieties best suited for their various purposes, as well as the best preventives of insect pests. Prof. Maynard has shown marked skill in the condition and variety of his greenhouse plants, also in the arrangement of his grounds, and the fine collection of hardy and half-hardy plants for his borders.

WM. H. SPOONER,

Delegate.

December 1st, 1900.

REPORT

TO THE

STATE BOARD OF AGRICULTURE,

FOR THE YEAR 1900.

HON. J. W. STOCKWELL, *Secretary State Board of Agriculture*,

DEAR SIR:—

As Inspector to the Massachusetts Horticultural Society I make the following report:

The Spring Exhibition of the Society opened March 20, 1900, with a splendid display of plants and flowers, Spring bulb plants, and a fine collection of fruits and vegetables. A collection of curious old Japanese plants, some one hundred years old, was shown. The Rhododendron Exhibition opened June 12th with many specimens of very excellent variety. In addition there were many potted and cut flowers. This exhibition was originally intended for June 6th, but the season being very unfavorable for the growth of these plants, it was postponed, and the visitors saw that nothing had been lost by waiting. June 22d the Rose and Strawberry Exhibition was opened, and there was in addition a very handsome display of grapes and peaches; also a large collection of vegetables. The roses were especially beautiful. September 5th and 6th the Annual Plant and Flower Show was held. Magnificent specimens of both were shown; also foreign grapes. September 27th and 28th the Fruit and Vegetable Show was held, the halls being filled with masses of familiar and new varieties. The number of varieties and novelties was greater than at any show the Society has held. November 6–9 the Chrysanthemum Show was held. There was an excellent collection of these flowers, many new kinds showing the skill of the gardener.

Prize exhibitions of plants and flowers were held on Saturday, January 6th and Saturday, February 3d, from 12 M. to 2 P.M. A prize exhibition of vegetables was held on Saturday, April 7th; one of plants, flowers, and vegetables, on Saturday, May 5th; one of pelargoniums, hardy primulas, and herbaceous plants, on Saturday, May 19th; a special Pæony Exhibition, on Saturday, June 16th; a special exhibition of aquatic plants, etc., on Saturday, August 18th; an exhibition of flowers, fruits, and vegetables, on Saturday, September 15th; and one of winter fruits and vegetables on Saturday, November 17th. All of these were open from 12 M. to 3 P.M. A special exhibition of orchids was held on Saturday, December 8th, from 12 M. to 2 P.M. Prize exhibitions were held every Saturday from June 30th to August 18th, inclusive.

The Society appropriated $8,150 for prizes for the year 1900.

April 1, 1901, the Society hopes to be in its new building, corner of Massachusetts and Huntington Avenues, where everything will be more to the advantage of the exhibitors.

Respectfully submitted,

N. I. Bowditch,

Inspector.

REPORT

OF THE

Committee on Lectures and Publication,

FOR THE YEAR 1900.

The Committee on Lectures and Publication submit the following report:

In the winter of 1900 we had the following Lectures delivered in our Hall:—

January 13. The Rusts of Horticultural Plants. By Professor Byron D. Halsted, of New Brunswick, N. J. This Lecture was delivered on the John Lewis Russell Foundation.

January 20. Half a Century's Experience in Ornamental Tree Planting. By O. B. Hadwen, Worcester.

January 27. The Procession of Fowers. By Miss Mira Lloyd Dock, Harrisburg, Pa.

February 10. Gardens, Fields, and Wilds of the Hawaiian Islands. By John K. M. L. Farquhar, Boston.

February 17. The Future Outlook for the Fruit Grower. By S. D. Willard, Geneva, N. Y.

February 24. Stereopticon Lecture on Massachusetts Forestry. By Mrs. Mary Lathrop Tucker, Newton. This Lecture was under the auspices of the Massachusetts Forestry Association.

March 10. Carnations and their Development. By C. W. Ward, Queens, N. Y.

March 17. Japanese Plums. By George S. Butler, Cromwell, Conn.

March 24. Apple Culture for Profit. By J. H. Hale, South Glastonbury, Conn.

March 31. Fungus Diseases Common to Cucumbers, Tomatoes, and Lettuce Under Glass. By Professor George E. Stone, Amherst.

We have also had the following printed: Schedule of Prizes for 1900, Part II of Transactions of 1899, and minor publications.

Respectfully submitted,

AARON LOW,
JAMES H. BOWDITCH,
E. W. WOOD,
Committee.

REPORT

OF THE

COMMITTEE ON THE LIBRARY,

FOR THE YEAR 1900.

The year has been a prosperous one, as far as the library is concerned and the accessions to its stores have been as numerous and as valuable as those of the average of preceding years. The proverb that when one door shuts another door opens, has been well exemplified during the last two years. When the Stickney Fund lapsed, it might have been thought that the Library would come to a stand-still as far as the purchase of books was concerned, but the following year the Society allowed the Committee $1000, all we asked for, and this year, though the amount granted was necessarily curtailed, we have received $85.00 from the sale of duplicate books, and $91.00 of interest from the Farlow bequest. Moreover, this bequest of $2,500 which the Society has voted to apply to the needs of the Library, and the direct bequest of $5000 from the late J. D. W. French will go far toward replacing the Stickney Fund. Three collections of books have been received during the year; one from the late Waldo O. Ross, a former Chairman of the Library Committee,— largely devoted to succulent plants, in which Mr. Ross was much interested; one from Mr. French, in addition to the bequest of money just mentioned, and the third from Charles E. Richardson, being a part of the library of the late John Owen.

For obvious reasons we say nothing about lack of room; that appeal so frequently made in the past may now be omitted for many years; when we next report we shall be in new quarters with nothing to complain of on that score.

For the Committee,

W. E. Endicott,
Chairman.

REPORT

OF THE

SECRETARY AND LIBRARIAN.

The work in this department has, as usual, not varied widely from that of most years. In one respect I wish that it had. In my last report I remarked that "a chairman of a committee or a lecturer has it just as much in his power as ever to delay publication of the Transactions by negligence in making his report or in returning his paper with revisions." These words were too true and publication has again been delayed from these causes. Other unavoidable circumstances, among them an illness of two weeks, largely caused by close application and confinement, in a discouraging struggle to cope with work beyond the ability of the force employed here, have conspired to delay publication beyond what was desired and hoped for. The Schedule of Prizes, however, formed no exception to the rule that it should be ready by the first of January, and as much earlier as possible. The second part of the Transactions for 1899 was published in June, and the first part for 1900 is now nearly through the press. The Society may be assured that no efforts on my part or on the part of those who assist in the work in this room will be wanting to have all publications appear as early as possible, but we cannot undertake the impossible. I may add that one other society in this state has experienced the same trouble in the prompt issue of its publications, from the same causes that I have mentioned above.

In my last report I mentioned that on account of the crowded state of the bookcases it was deemed better to employ a larger part than before of the Society's appropriation in the binding of books and less in the purchase of books, and that this purpose had been carried out. It has been continued in the year since my last report, with the result that the number of books bound has been greater than in any previous year.

In 1896, at the suggestion of President Appleton, a special effort was made to procure such publications of the United States Department of Agriculture as we did not already possess. This effort has been continued to the present time, with the result that our set of these publications is very nearly complete. Its value will be greatly increased by a Card Catalogue of these publications which was begun by the Department during the present year, and is supplied gratuitously to all libraries deemed worthy to receive it. This result will, however, not be obtained without adding to the labor of those whose duty it is to care for the library, who already had in their charge three card catalogues, the smallest of which contains 20,000 cards.

The present year has been remarkable beyond any preceding one in the reception of three donations of books from deceased members, we having had the privilege of selecting such books as we desired from the libraries of Waldo O. Ross, a former Chairman, and J. D. W. French, a member, of the Library Committee. Our Treasurer, Charles E. Richardson, has also afforded us the same privilege with regard to the library of his uncle, the late John Owen. Mr. Ross having been especially interested in Succulent Plants, a large proportion of the books received from his library are on that subject, and in like manner those from Mr. French relate largely to Forestry, which was a favorite subject with him. Among these gifts are many valuable books which fill gaps in the Library that we have long desired to efface.

A gift of another class is "One Thousand American Fungi," by Charles McIlvaine and Robert K. Macadam, with colored plates and many other illustrations. A gratifying circumstance in connection with the acquisition of this book, on a subject in which so much interest is now felt, is that it was presented by Mr. Macadam in acknowledgment of the help derived from this library in its preparation. Another book on this subject is "Mushrooms, Edible, Poisonous, etc.," by George Francis Atkinson, Professor of Botany, in Cornell University. This book, which was acquired by purchase, is illustrated with many excellent photographs and colored plates.

Other notable acquisitions are the eighth and best edition of "Miller's Gardener's Dictionary;" also the first folio edition; "Munting's Phytographia Curiosa," folio, 1727; and a reprint of

"Walter of Henley's Husbandry," a work dating back to the thirteenth century. Lamarck's "Tableau Encyclopédique" has been completed, an object at which we have been aiming for several years. The new editions of Veitch's "Manual of the Coniferæ," and Barron's "Vines and Vine Culture," have been presented by the authors. Two volumes of Professor Bailey's Cyclopedia of American Horticulture have been published during the year, and of this comprehensive work we have bought two copies, in order to have one for circulation as well as reference. The same course has been pursued with regard to Nicholson's "Dictionary of Gardening," of which a supplementary volume has been published, to be followed by a second; and also with regard to some other works that are desired both for reference here and for home study. "The Century Book of Gardening" is an elegant work, which seems to have been suggested by the close of one century and the beginning of another. "The Book of Gardening, a Hand-book of Horticulture," edited by W. D. Drury, is a solid and comprehensive manual. Both these works are very fully illustrated. Mawson's "Art and Craft of Gardening," is one of the latest works specially devoted to landscape gardening. Eight more volumes of King's Photographs have been received during the year, containing views in parks in Rochester, Albany, Philadelphia, Baltimore, New York, Providence, Springfield, Washington, Buffalo, Detroit, Boston, and other cities, and also in Biltmore. "Nature's Garden, an aid to Knowledge of our Wild Flowers and their Insect Visitors," by Neltje Blanchan, with many colored plates, and other illustrations, is a more extensive attempt than those previously made to assist in the study of flowers by classifying them according to color.

"Our Native Ferns, a History of the British Species and their Varieties," by E. J. Lowe, in two volumes, with seventy-nine colored plates, and nine hundred and seventy-six wood cuts, is believed to make our collection of the books of this enthusiast in fern study and culture complete. Harshberger's "Botanists of Philadelphia and their Work," is an exceedingly interesting contribution to the history of Botany in America. Many more might be mentioned, but we must cease with the "Flore d'Owara et de Benin en Afrique," a folio volume by M. Palisot-Beauvois, with one hundred and twenty colored plates of the plants of that region.

Before the close of another year we trust that the Library will be in a room where there is space enough to permit of the arrangement of the books so that one volume shall never be hidden by another.

ROBERT MANNING,

Secretary and Librarian.

TREASURER'S REPORT.

FOR THE YEAR 1900.

MASSACHUSETTS HORTICULTURAL SOCIETY, *in account current with* CHARLES E. RICHARDSON, *December 31st, 1900.*

DR.

To amount paid on account of Library in 1900				$700 00
" " " Interest on Funds for Prizes, credited opposite				1,792 99
" " " Mortgage				225,000 00
" " " Interest on Mortgage				4,025 00
" " " on account of Building on Massachusetts Ave.				87,696 83
" " loaned on call with collateral security				130,000 00
" " " Wm. A. Hayes and A. P. Loring, Trustees				3,488 76
" " paid for Chicago & West Michigan R. R. Bonds				9,987 50
" " " " Kansas City, Fort Scott & Memphis R.R. Bonds				27,523 75
" " " " Chicago, Burlington & Quincy, Ill. Div., R. R. Bonds				51,625 00
" " " " Legal Services in settlement of F. B. Hayes's Estate				3,586 35
" " " " Taxes on Real Estate in South Boston				189 63
" " " on Prizes awarded in 1899 paid in 1900, viz.:				
" " " " for Plants		$2,072 10		
" " " " " Flowers		2,061 27		
" " " " " Fruits		1,596 00		
" " " " " Vegetables		1,185 80		
" " " " " Gardens and Greenhouses		365 00		
" " " " " Native Plants		167 85		
" " " " " School Gardens and Children's Herbariums		112 50		
" " " " " H. H. Hunnewell Triennial Prize		160 00		
" " " " " H. H. Hunnewell, Prizes for Rhododendrons		105 00		
				$7,825 52
Amount carried forward				$553,441 33

Amount brought forward		$553,441 33
To amount paid for Heating . . .	$638 41	
" " " " Lighting	691 72	
" " " " Water Rates . . .	211 28	
" " " " Labor	2,247 87	
" " " " Stationery, Printing, and Postage	1,361 89	
" " " " Taxes	2,998 00	
" " " " Incidentals	1,402 58	
" " " " Repairs . . .	136 97	
" " " " Committee of Arrangements	289 50	
" " " " " on School Gardens and Children's Herbariums	37 92	
" " " " Committee on Lectures and Publication . . .	245 00	
" " " " Committee on Forestry and Roadside Improvement	9 25	
" " " " Salaries of Treasurer, Secretary and Assistants . .	4,300 00	
" " " " Salaries of Committees .	1,160 00	
" " " " Rent of Building on Tremont Street	11,733 33	
" " " " Legal Services . . .	85 00	
		27,548 72
		$580,990 05
Balance of Cash December 31st, 1900		74,864 73
		$655,854 78

CR.

By Balance of account rendered December 30, 1899 . .			$23,920 27
Received from Sale of Estate on Tremont Street. . . .	$600,000 00		
Less Commission and Advertising	6,132 05		
		$593,867 95	
Received from Loan of Tables		22 00	
" " Building in 1900, viz.:			
" " Rent of Halls . .	1,840 00		
" " " " Stores . .	13,520 00		
		15,360 00	
" " Admissions and Assessments .		1,554 00	
" " Annual Exhibitions, Gross	992 25		
Less Expenses .	442 62		
		549 63	
Amounts carried forward		$611,353 58	$23,920 27

Amounts brought forward . . .		$611,353 58	$23,920 27
Received from Mt. Auburn Cemetery . . .		3,410 69	
" " State Bounty		600 00	
" " Sales of Transactions . . .		6 50	
" " Interest on Bonds .	7,490 77		
" " " " Bank Balances	3,004 39		
		10,495 16	
" " Insurance		67 83	
" " Bequest of John S. Farlow . .		2,541 09	
" " " " Francis Brown Hayes .		1,666 67	
" Interest credited the following Funds charged opposite:			
Samuel Appleton Fund .	$50 00		
John A. Lowell " .	50 00		
Theodore Lyman " .	550 00		
Josiah Bradlee " .	50 00		
Benjamin V. French " .	25 00		
W. J. Walker " .	117 72		
Levi Whitcomb " .	25 00		
Benjamin B. Davis " .	25 00		
Marshall P. Wilder " .	50 00		
John Lewis Russell " .	50 00		
H. H. Hunnewell " .	200 00		
Francis Brown Hayes " .	500 00		
Henry A. Gane " .	50 00		
John S. Farlow " .	50 27		
		1,792 99	
			631,934 51
			$655,854 78

(Signed) CHARLES E. RICHARDSON,
Treasurer.

Approved:

WALTER HUNNEWELL,
C. S. SARGENT,
O. B. HADWEN,
} *Finance Committee.*

28 State Street, Boston, March 7, 1901.

MESSRS. WALTER HUNNEWELL,
CHARLES S. SARGENT,
O. B. HADWEN,
Finance Committee of the
Massachusetts Horticultural Society.

Gentlemen:— In compliance with your request, I have made a thorough audit of the books and general accounting affairs of the

Massachusetts Horticultural Society for the year which ended with December 31st, 1900, and herewith submit to you my report of the same.

Report.

I added the ledger, journal and cash book and the small books tributary to the cash book, and saw that all balances were correctly carried forward, and examined and checked the vouchers representing the disbursements during the year and found them adequate. I also traced all postings from journal and cash book into the ledger and proved the correctness of the balance sheet taken from the ledger as of the 31st day of December, 1900, which is a true statement of the financial condition of the Society upon said date, to the best of my knowledge and belief. I found the amount of cash required by the cash book upon the first day of January, 1901 to have been on hand, and I examined the securities of the Society in the custody of the Treasurer and found that they were in accordance with the requirements of the record. In short, I satisfied myself that the work in connection with the accounting matters of the Society was being honestly and faithfully performed.

Yours Very Respectfully,

ANDREW STEWART,

Examiner of Accounts.

ASSETS AND LIABILITIES OF THE MASSACHUSETTS HORTICULTURAL SOCIETY.

DECEMBER 31, 1900.

ASSETS.

Real Estate	$318,084 08	
" " in South Boston	358 62	
Furniture and Exhibition Ware	7,707 50	
Library	39,812 47	
Stereotype Plates and Copies of History	246 50	
Sinking Fund	23,872 50	
Chicago, Burlington & Quincy R. R. Bonds	1,000 00	
Kansas City, Clinton & Springfield " "	1,980 00	
Lake Shore & Michigan Southern " "	10,415 25	
Atchison, Topeka & Santa Fé " "	44,693 25	
Chicago, Burlington & Quincy, Nebraska Extension, R. R. Bonds	50,012 50	
Chicago & West Michigan R. R. Bonds	9,987 50	
Kansas City, Fort Scott & Memphis R. R. Bonds	27,523 75	
Chicago, Burlington & Quincy, Ill. Division, R. R. Bonds	51,625 00	
City of Newton Bonds	24,228 75	
Loan with Collateral Security	130,000 00	
" to W. A. Hayes and A. P. Loring, Trustees	3,488 76	
Bills Receivable	6,630 79	
Cash	74,864 73	
		$826,531 95

LIABILITIES.

Prize Funds invested in Building:			
Samuel Appleton Fund,	$1,000 00		
Theodore Lyman "	11,000 00		
Josiah Bradlee "	1,000 00		
Benjamin V. French "	500 00		
H. H. Hunnewell "	3,000 00		
W. J. Walker "	2,354 43		
Levi Whitcomb "	500 00		
Benjamin B. Davis "	500 00		
John Lewis Russell "	1,000 00		
Francis Brown Hayes "	10,000 00		
Henry A. Gane "	1,000 00		
		$31,854 43	
Amount carried forward		$31,854 43	

Amount brought forward		$31,854 43	
Prize Funds invested in Bonds:			
Marshall P. Wilder Fund	1,000 00		
John A. Lowell "	1,000 00		
H. H. Hunnewell "	1,000 00		
		3,000 00	
		34,854 43	
Prizes for 1900 payable in 1901		8,275 00	
			$43,129 43
Surplus			783,402 52
			$826,531 95

C. E. RICHARDSON,
Treasurer.

MEMBERSHIP ACCOUNT OF THE MASSACHUSETTS HORTICULTURAL SOCIETY, DECEMBER 31st, 1900.

Life Membership per last report		659	
Added in 1900		35	
Commuted from Annual		2	
Reinstated		1	
			697
Deceased			15
			682
Annual Membership per last report		199	
Added in 1900		11	
			210
Commuted to Life		2	
Resigned		1	
Deceased		4	
Dropped for non-payment of Assessment for two years		4	
			11
			199
Present Membership			881

INCOME FROM MEMBERSHIP.

35 new Life Members @ $30	$1,050 00
2 Commuted to Life at @ $20	40 00
11 new Annual Members @ $10	110 00
Annual Assessments	354 00
	$1,554 00

C. E. RICHARDSON,
Treasurer.

Dr. *Massachusetts Horticultural Society in account with the Proprietors of the Cemetery of Mount Auburn.* **Cr.**

For Sales and Improvements within the Cemetery for the year ending December 31, 1900.

To cost of filling up and improving land at Mount Auburn for the year ending Dec. 31st, 1900, the Massachusetts Horticultural Society being charged with their proportion of same:			By Sales in January		$985 00
Rear Fern Path	$97 87		" " " February		615 00
Between Cherry and Birch Avenues	61 87		" " " March		460 00
Glen Avenue	46 50		" " " April		792 00
	$206 24		" " " May		1,309 50
One-fourth part of $206.24	$51 56		" " " June		1,420 00
Balance due Mass. Horticultural Society,	3,410 69		" " " July		525 00
			" " " August		1,380 00
			" " " September		957 50
			" " " October		1,140 00
			" " " November		1,230 00
			" " " December		3,500 00
					$14,314 00
			Net amount received from Receiving Tomb		935 00
					$15,249 00
			Deduct for annual expenses		1,400 00
					$13,849 00
	$3,462 25		Mass. Horticultural Society, ¼ part of $13,849.00		$3,462 25

E. & O. E.

DECEMBER 31, 1900.

JONH L. DILL, *Treasurer.*

THE MASSACHUSETTS HORTICULTURAL SOCIETY

To the PROPRIETORS OF THE CEMETERY OF MOUNT AUBURN. *Dr.*

To cost of filling up and improving land at Mount Auburn for the year ending Dec. 31st, 1900, the Massachusetts Horticultural Society being charged with their proportion of same.

Rear Fern Path.

11.1 days, man and horse	$41 62	
25 days, man	56 25	
		$97 87

Between Cherry and Birch Avenues.

16.5 days, man and horse	61 87

Glen Avenue.

12.4 days, man and horse	46 50
	$206 24
One-fourth of $206.24	$51 56

JAMES C. SCORGIE,
Supt. of the Cemetery of Mount Auburn.

MOUNT AUBURN, December 31, 1900.

I certify the foregoing to be a true copy of improvements for the year 1900, rendered by the Superintendent.

JOHN L. DILL,
Treasurer.

Massachusetts Horticultural Society.

OFFICERS AND STANDING COMMITTEES FOR 1901.

President.

O. B. HADWEN, of Worcester.

Vice-Presidents.

WALTER HUNNEWELL, of Wellesley.
CHARLES F. CURTIS, of Jamaica Plain.
BENJAMIN P. WARE, of Clifton.
BENJAMIN M. WATSON, of Jamaica Plain.

Treasurer and Superintendent of the Building.

CHARLES E. RICHARDSON, of Brookline.

Secretary and Librarian.

ROBERT MANNING, of Salem.*

Professor of Botany and Vegetable Physiology.

BENJAMIN M. WATSON, of Jamaica Plain.

Professor of Entomology.

SAMUEL H. SCUDDER, of Cambridge.

Delegate to the State Board of Agriculture.

WILLIAM H. SPOONER, of Jamaica Plain.

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*Communications to the Secretary, on the business of the Society, should be addressed to him at Horticultural Hall, Boston.

STANDING COMMITTEES.

Executive.

THE PRESIDENT, O. B. HADWEN, CHAIRMAN.

THE CHAIRMAN OF THE FINANCE COMMITTEE, WALTER HUNNEWELL, *Ex officio*.

WILLIAM C. STRONG. FRANCIS H. APPLETON.
WILLIAM H. SPOONER. BENJAMIN C. CLARK.
NATHANIEL T. KIDDER. CHARLES W. PARKER.
CHARLES F. CURTIS.

Finance.

WALTER HUNNEWELL, OF BOSTON, CHAIRMAN.

O. B. HADWEN. CHARLES S. SARGENT.

Lectures and Publication.

AARON LOW, OF HINGHAM, CHAIRMAN.

JAMES H. BOWDITCH. E. W. WOOD.

Library.

WILLIAM E. ENDICOTT, OF CANTON, CHAIRMAN.

GEORGE W. HUMPHREY. GEORGE E. DAVENPORT.
WALTER S. PARKER. CHARLES W. SWAN.

Plants.

[CHAIRMANSHIP VACANT.]

JAMES WHEELER. ARTHUR H. FEWKES.
WILLIAM J. MARTIN. ROBERT CAMERON.

Flowers.

J. WOODWARD MANNING, OF READING, CHAIRMAN.

MICHAEL H. NORTON. FREDERICK S. DAVIS.
KENNETH FINLAYSON. JAMES COMLEY.

Fruits.

E. W. WOOD, OF WEST NEWTON, CHAIRMAN.

CHARLES F. CURTIS. WARREN FENNO. SUMNER COOLIDGE.
O. B. HADWEN. J. WILLARD HILL. GEORGE F. PIERCE.

Vegetables.

WARREN H. HEUSTIS, OF BELMONT, CHAIRMAN.

CEPHAS H. BRACKETT. WALTER RUSSELL. GEORGE D. MOORE.
VARNUM FROST. AARON LOW. JOSHUA C. STONE.

Forestry and Roadside Improvement.

HARVEY N. SHEPARD, CHAIRMAN.

NATHANIEL S. SHALER. HENRY S. HUNNEWELL.
J. WOODWARD MANNING. JAMES STURGIS PRAY, SECRETARY.

Gardens.

PATRICK NORTON, OF DORCHESTER, CHAIRMAN.

CHAIRMEN OF THE COMMITTEES ON PLANTS, FLOWERS, FRUITS, VEGETABLES, AND ARRANGEMENTS, *Ex-officiis*.

HENRY W. WILSON. JACKSON T. DAWSON.

For Establishing Prizes.

WILLIAM J. STEWART, OF WINCHESTER, CHAIRMAN.

CHAIRMEN OF THE COMMITTEES ON PLANTS, FLOWERS, FRUITS, VEGETABLES, AND GARDENS, *Ex-officiis*.

WILLIAM J. MARTIN.

Committees of Arrangements.

JOSEPH H. WOODFORD, OF BOSTON, CHAIRMAN.

CHAIRMEN OF THE COMMITTEES ON PLANTS, FLOWERS, FRUITS, VEGETABLES, AND GARDENS, *Ex-officiis*.

ROBERT FARQUHAR.

STANDING COMMITTEES.

Executive.

THE PRESIDENT, O. B. HADWEN, CHAIRMAN.

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NATHANIEL T. KIDDER.
FRANCIS H. APPLETON.
BENJAMIN C. CLARK.
CHARLES W. PARKER.
CHARLES F. CURTIS.

Finance.

WALTER HUNNEWELL, OF BOSTON, CHAIRMAN.

O. B. HADWEN.
CHARLES S. SARGENT.

Lectures and Publication.

AARON LOW, OF HINGHAM, CHAIRMAN.

JAMES H. BOWDITCH.
E. W. WOOD.

Library.

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MEMBERS FOR LIFE.

Members of the Society and all other persons who may know of deaths, changes in residence, or other circumstances showing that the following list is incorrect in any particular, will confer a favor by promptly communicating to the Secretary any needed corrections.

Information, or any clew to it, is especially desired in regard to members whose names are marked thus.†

Adams, Mrs. Charles Francis, South Lincoln.
Adams, Henry Saxton, Dorchester.
Adams, Luther, Newton.
Alger, Rev. R. F., Becket.
Allen, Hon. Charles H., Lowell.
Allen, Thomas, Boston.
Ames, F. Lothrop, North Easton.
Ames, Mrs. F. L., North Easton.
Ames, George, Boston.
Ames, John S., North Easton.
Ames, Miss Mary S., North Easton.
Ames, Oakes, North Easton.
Ames, Oliver, North Easton.
Ames, Mrs. Oliver, Sr., North Easton.
Ames, Preston Adams, Boston.
Ames, Miss Susan E., North Easton.
Amory, C. W., Boston.
Amory, Frederick, Boston.
Anderson, Larz, Brookline.
Andrews, Charles L., Milton.
Andrews, Frank W., Washington, D. C.
Andros, Milton, San Francisco, Cal.
Appleton, Francis H., Boston.
Appleton, William S., Boston.
Arnold, Mrs. George Francis, Brookline.
Ash, John, Pomfret Centre, Conn.
Asmus, Ernst G., West Hoboken, N. J.
Atkins, Edwin F., Belmont.
Ayer, James B., Boston.

Bailey, Jason S., West Roxbury.
Ball, George H., Boston.
Bancroft, John C., Boston.
Banfield, Francis L., M.D., Worcester.
Barber, J. Wesley, Newton.
Barnard, James M., Boston.
Barnard, Robert M., Everett.
Barnes, Walter S., Somerville.
† Barney, Levi C., Boston.
Barry, John Marshall, Boston.
Barry, William C., Rochester, N. Y.
Bartlett, Edmund, Newburyport.
Bartlett, Francis, Beverly.
Baylies, Walter C., Taunton.
Beal, Leander, Swampscott.
Becker, Frederick C., Cambridge.
Beckford, Daniel R., Jr., Dedham.
Beebe, E. Pierson, Boston.
Beebe, Franklin H., Boston.
Beebe, J. Arthur, Boston.
Bigelow, Albert S., Cohasset.
Bigelow, Joseph S., Cohasset.
Bigelow, Dr. William Sturgis, Boston.
Black, George N., Manchester.

Blake, Miss Anne, Brookline.
Blake, Mrs. Arthur W , Brookline.
Blake, Edward D., Boston.
Blake, Francis, Weston.
Blake, Frederick A., Rochdale.
Blakemore, John E., Roslindale.
Blanchard John W., West Newton.
Blinn, Richard D., Chicago, Ill.
Bliss, William, Boston.
Boardman, Samuel M., Hyde Park.
Boardman, T. Dennie, Manchester.
Bôcher, Prof. Ferdinand, Cambridge.
Bockus, Charles E., Dorchester.
Bosler, Frank C., Carlisle, Penn.
Bowditch, Charles P., Jamaica Plain.
Bowditch, Ernest W., Milton.
Bowditch, James H., Brookline.
Bowditch, Nathaniel I., Framingham.
Bowditch, William E., Roxbury.
Bowker, William H., Boston.
Brackett, Cephas H., Newton.
Breck, Joseph Francis, Allston.
Bremer, Mrs. John L., Manchester.
Bresee, Albert, Hubbardton, Vt.
Brewer, Francis W., Hingham.
Briggs, William S., Lincoln.
Brigham, William T., Honolulu, Hawaii.
Brooks, Henry, Lincoln.
Brooks, J. Henry, Milton.
Brooks, Lawrence, Groton.
Brooks, Peter C., Boston.
Brooks, Shepherd, Boston.
Brown, Edward J., Weston.
Brown, George Barnard, Brookline.
Brown, John M., Belmont.
Brown, John T., Newburyport.
Brown, Samuel N., Boston.
Burlen, William H., Boston.
Burnett, Harry, Southborough.
Burnham, John A., Manchester.
Burnham, Lamont G., Essex.
Burr, Matthew H., Hingham.
Buswell, Frank E., Brooklyn, N Y.
Butler, Aaron, Wakefield.
Butler, Edward K., Jamaica Plain.
Cabot, Dr. Arthur T., Boston.
†Cadness, John, Flushing, N. Y.
Cains, William, South Boston.
Calder, Augustus P., Boston.
Cameron, Robert, Cambridge.
Campbell, Francis, Cambridge.
Capen, John, Boston.
Carlton, Samuel A., Boston.
Carr, Hon. John, Roxbury.
Carter, Charles N., Boston.
Carter, Miss Maria E., Woburn.
Cartwright, George, Dedham.
Casas, W. B. de las, Malden.
Chadbourne, Marshall W., East Watertown.
Chaffin, John C., Newton.
Chamberlain, Chauncy W., Brookline.
†Chase, Andrew J., Lynn.
Chase, Daniel E , Somerville.
Chase, George B., Dedham.
Chase, William M., Dorchester.
Cheney, Amos P., Natick.
Cheney, Mrs. Elizabeth S., Wellesley.
Childs, Nathaniel R., Boston.
Choate, Charles F., Southborough.
Christie, William, Chelsea.
Claflin, Hon. William, Newtonville.
Clapp, Edward B., Dorchester.
Clapp, James H., Dorchester.
Clapp, William C., Dorchester.
Clark, Benjamin C., Boston.
Clark, B. Preston, Cohasset.
Clark, Miss Eleanor J., Pomfret Centre, Conn.
Clark, J. Warren, Rockville.
Clarke, Miss Cora H., Boston.
Clarke, Eliot C., Boston.
Cleary, Lawrence, Roxbury.
Clough, Micajah Pratt, Lynn.
Cobb, John C., Milton.
Coburn, Isaac E., Everett.
Codman, James M., Brookline.
Codman, Ogden, South Lincoln.
Cole, Edward E., Boston.

Collamore, Miss Helen, Boston.
Colton, Samuel H., Worcester.
Converse, Elisha S., Malden.
Converse, Col. H. E., Malden.
Coolidge, Joshua, Mount Auburn.
Coolidge, J. Randolph, Chestnut Hill.
Coolidge, Mrs. J. Randolph, Chestnut Hill.
Coolidge, T. Jefferson, Jr., Boston.
Cottle, Henry C., Boston.
Cowing, Walter H., Brookline.
Cox, Thomas A., Dorchester.
Coy, Samuel I., Boston.
Crane, Zenas, Dalton.
Crawford, Dr. Sarah M., Roxbury.
Crocker, Hon. George G., Boston.
Crocker, Miss S. H., Boston.
Crosby, George E., West Medford.
Crowell, Randall H., Watertown.
Curtis, Charles F., Jamaica Plain.
Curtis, Charles P., Swampscott.
Curtis, Charles P., Jr., Boston.
Cushing, Livingston, Weston.
Cushing, Robert M., Boston.
Cutting, Gen. Walter, Pittsfield.

† Daggett, Henry C., Boston.
Dalton, Charles H., Beverly.
Daly, John C., Roxbury.
Damon, Frederick W., Arlington.
Dana, Charles B., Wellesley.
Daniels, Dr. Edwin A., Boston.
Davenport, Albert M., East Watertown.
Davenport, Edward, Dorchester.
Davenport, George E., Medford.
Davis, Edward L., Worcester.
Davis, John, Lowell.
Davis, L. Shannon, Brookline.
Dawson, Jackson T., Jamaica Plain.
Dee, Thomas W., Cambridge.
Denny, Clarence H., Boston.
Denton, Eben, Dorchester.
Dewson, Francis A., Newtonville.
Dexter, F. Gordon, Boston.
Dexter, George, Beverly.
Dike, Charles C., Stoneham.
Doliber, Thomas, Brookline.
Donald, William, West Roxbury.
Donaldson, James, Roxbury.
Dorr, George, Dorchester.
Dove, George W. W., Andover.
Dowse, William B. H., West Newton.
Draper, Hon. Eben S., Hopedale.
Draper, George A., Hopedale.
Dreer, William F., Philadelphia, Pa.
Dumaresq, Herbert, Chestnut Hill.
Duncan, James L., Chelsea.
Dunlap, James H., Nashua, N. H.
Durant, William, Boston.
Durfee, George B., Fall River.
Dutcher, Frank J., Hopedale.
Dwight, Theodore F., Kendal Green.

Eaton, Horace, Cambridge.
Edgar, William W., Waverly.
Eldredge, H. Fisher, Boston.
† Eldridge, E. H., Roxbury.
Ellicott, Joseph P., Boston.
Elliot, Mrs. John W., Boston.
Elliott, William H., Brighton.
Endicott, William, Boston.
Endicott, William, Jr., Boston.
Endicott, William C., Jr., Danvers.
Endicott, William E., Canton.
Estabrook, Arthur F., Boston.
Ewell, Warren, Dorchester.

Fairchild, Charles, Boston.
Falconer, William, Pittsburgh, Pa.
Farlow, Lewis H., Newton.
Farlow, Mrs. William G., Cambridge.
Farnsworth, Mrs. William, Dedham.
Farquhar, James F. M., Roslindale.
Farquhar, John K. M. L, Roxbury.
Farquhar, Robert, North Cambridge.
Faxon, John, Quincy.
Fay, H. H., Wood's Holl.
Fay, Joseph S., Jr., Wood's Holl.
Fenno, L. Carteret, Boston.
Fessenden, George B., Allston.
Fewkes, Arthur H., Newton Highlands.

Finlayson, Kenneth, Brookline.
Fisher, James, Roxbury.
Flagg, Augustus, Boston.
Fletcher, George V., Belmont.
Fletcher, J. Henry, Belmont.
Fletcher, John W., Chelsea.
Flint, David B., Boston.
Foster, Charles H. W., Brookline.
Foster, Francis C., Cambridge.
Fottler, John, Jr., Dorchester.
Fowle, George W., Jamaica Plain.
Fowle, William B., Auburndale.
French, Miss Caroline L. W., Boston.
French, Jonathan, Boston.
French, S. Waldo, Jamaica Plain.
French, W. Clifford, Cambridge.
Frohock, Roscoe R., Malden.
Frost, Irving B., Belmont.

Galloupe, Charles W., Swampscott.
Galvin, John, Boston.
Gardner, George A., Boston.
Gardner, George P., Boston.
Gardner, John L., Boston.
Gardner, Mrs. John L., Brookline.
Gardner, William Amory, Groton.
Gaston, William A., Boston.
Gibbs, Wolcott, M.D., Newport, R.I.
Gill, George B., Medford.
Gillard, William, Dorchester.
Gilmore, E. W., North Easton.
Gilson, F. Howard, Wellesley Hills.
Glover, Joseph B., Boston.
Goddard, A. Warren, Brookline.
Goddard, Joseph, Sharon.
Goodell, L. W., Dwight.
Gorham, James L., Jamaica Plain.
† Gould, Samuel, Boston.
Gowing, Mrs. Clara E., Kendal Green.
Gray, James, Wellesley.
Gray, Mrs. John C., Boston.
Gregory, Hon. James J. H., Marblehead.
Grew, Edward S., Boston.
Grey, Benjamin, Malden.

Hadwen, Obadiah B., Worcester.
Hale, James O., Byfield.
Hall, Edwin A., Cambridgeport.
Hall, George A., Chelsea.
Hall, Jackson E., Boston.
Hall, Osborn B., Malden.
Hall, William F., Brookline.
Halliday, William H., South Boston.
Hammond, Gardiner G., New London, Conn.
Hammond, George W., Boston.
† Harding, George W., Arlington.
Harding, Louis B., Stamford, Conn.
Hardy, F. D., Cambridgeport.
Harlow, James F., Quincy.
Harris, Charles, Cambridge.
Harris, Thaddeus William, A.M., Keene, N. H.
Hartshorn, Arthur E., Worcester.
Harwood, George Fred, Newton.
Haskell, Edwin B., Auburndale.
Hastings, Levi W., Brookline.
Hatch, Mrs C. S., North Cambridge.
Hatch, Edward, Boston.
Haven, Franklin, Boston.
Hawken, Mrs. Thomas, Rockland, Me.
Hayward, George P., Roxbury.
† Hazeltine, Hazen, Boston.
Hemenway, Augustus, Canton.
Hemenway, Mrs. Augustus, Canton.
Henshaw, Joseph P. B., Boston.
Henshaw, Samuel, Cambridge.
Heurlin, Julius, South Braintree.
Hewett, Miss Mary C., Canton.
Hews, Albert H., North Cambridge.
Higginson, Francis L., Boston.
Hilbourn, A. J., Boston.
Hill, John, Stoneham.
Hittinger, Jacob, Mt. Auburn.
Hoar, Samuel, Concord.
Hodgkins, John E., Portsmouth, N.H.

Hoitt, Hon. Charles W., Nashua, N. H.
Hollingsworth, Amor L., Milton.
Hollingsworth, Z. T., Boston.
Hollis, George W., Grantville.
Holt, Gustavus C., Belmont.
Holt, Mrs. Stephen A., Winchester.
Holt, William W., Winchester.
Hooper, William, Boston.
Horner, Mrs. Charlotte N.S., Georgetown.
Hovey, Charles H., South Pasadena, Cal.
Hovey, Stillman S., Woburn.
Howard, Joseph W., Somerville.
Hubbard, Charles Wells, Weston.
Hubbard James C., Everett.
Humphrey, George W., Dedham.
Hunnewell, Arthur, Wellesley.
Hunnewell, Henry Sargent, Wellesley.
Hunnewell, H. Hollis, Wellesley.
Hunnewell, Walter, Wellesley.
Hunt, Dudley F., Reading.
Hunt, Francis W., Melrose.
Hunt, Franklin, Charlestown, N. H.
Hunt, William H , Concord.

Jack, John George, Jamaica Plain.
Jackson. Charles L., Cambridge.
Jackson, Robert T., Boston.
James, George Abbot, Nahant.
Janvrin, William S., Revere.
Jeffries, William A., Boston.
Jenks, Charles W., Bedford.
Johnson, J. Frank, Malden.
Jones, Jerome, Brookline.
Jones, Dr. Mary E , Boston.
Jordan, Eben D., Boston.
Jordan, Henry G., Hingham.
Jose, Edwin H., Cambridgeport.

Kakas, Edward, West Medford.
Kellen, William V., Marion.
Kelley, George B., Jamaica Plain.
Kendall, D. S., Woodstock, Ont.
Kendall, Edward, Cambridgeport.
† Kendall, Joseph R., San Francisco, Cal.
Kendall, Dr. Walter G., Atlantic.
Kendrick, Mrs. H. P., Allston.
Kennedy, George G , M. D., Roxbury.
Kent, John, Chestnut Hill.
† Keyes, E. W., Denver, Col.
Keyes, John M., Concord.
Kidder, Charles A., Southborough.
Kidder, Nathaniel T., Milton.
† Kimball, A. P., Boston.
Kimball, David P., Boston.
King, D. Webster. Boston.
Kingman, Abner A., Brookline.
Kingman, C. D., Middleborough.
Knapp, Walter H., Newtonville.

Lamb, Horatio A., Milton.
Lancaster, Charles B., Boston.
Lanier, Charles, Lenox.
Lawrence, Amory A., Boston.
Lawrence, Amos A., Boston.
Lawrence, James, Groton.
Lawrence, John, Groton.
Lawrence, Rt. Rev. William, Boston.
Learned, Charles A., Arlington.
Lee, Daniel D., Jamaica Plain.
Lee, Francis H., Salem.
Lee, George C., Newton.
Leeson, Hon. Joseph R., Newton Centre.
Lemme, Frederick, Charlestown.
Leuchars, Robert B., Dorchester.
Lewis, Edwin C., Taunton.
Lewis, William G., Framingham.
Lincoln, George, Hingham.
Lincoln, Col. Solomon, Boston.
Little, James L., Brookline.
Little, John Mason, Swampscott
Locke, Isaac H., Belmont.
Lockwood, Rhodes, Boston.
Lodge, Richard W., Boston.

Loftus, John P., Dorchester.
Loomis, Elihu G., Bedford.
Loring, Augustus P., Beverly.
Loring, Mrs. William Caleb, Beverly.
Lothrop, William S. H , Boston.
† Lowder, John, Watertown.
Lowell, Abbott Lawrence, Boston.
Luke, Otis H., Brookline.
Lumb, William, Boston.
Lunt, William W., Hingham.
Lyman, George H., Wareham.
Lyman, Mrs. Theodore, Brookline.

Mabbett, George, Plymouth.
Mackie, George, M. D., Attleboro.
† Mahoney, John, Boston.
Mallett, E. B., Jr., Freeport, Me.
Mann, James F., Ipswich.
Manning, Jacob W., Reading.
Manning, J. Woodward, Reading.
Manning, Mrs. Lydia B., Reading.
Manning, Robert, Salem.
Manning, Warren H., Brookline.
Marshall, Frederick F., Everett.
Marston, Howard, Boston.
Mason, Miss Ellen F., Boston.
Mason, Col. Frederick, Taunton.
Matthews, Nathan, Boston.
May, Frederick W. G., Boston.
McCarty, Timothy, Providence, R. I.
McWilliam, George, Whitinsville.
Melvin, James C., West Newton.
Merriam, Charles, Boston.
Merriam, Herbert, Weston.
Merrill, Hon. Moody, Roxbury.
Metivier, James, Cambridge.
Milmore, Mrs. Joseph, Washington, D. C.
Minot, Charles S., Milton.
Minton, James, Boston.
Mitton, Edward J., Brookline.
Mixter, George, Boston.
Monteith, David, Dedham.
Montgomery, Alexander, Natick.
Moore, John H., Concord.
Morgan, George H., New York, N. Y.
Morse, John T., Jr., Boston.
Morse, Robert M., Jamaica Plain.
Moseley, Charles H., Dorchester.
Mudge, George A., Portsmouth, N. H.
Murphy, William Bowen, Boston.
Murray, Peter, Fairhaven.
Mutch, John, Brookline.

Nevins, Mrs. David, Methuen.
Newman, John R., Winchester.
Newton, Rev. William W., Pittsfield.
Nickerson, George A., Dedham.
Nickerson, Mrs. George A., Dedham.
Norton, Charles W., Allston.
Norton, Edward E., Boston.

Oakman, Hiram A., North Marshfield.
Olmsted, Frederick Law, Jr., Brookline.
Olmsted, John C., Brookline.
Orpet, Edward O., South Lancaster.

Page, Mrs. Henrietta, Boston.
Paige, Clifton H., Mattapan.
Parker, Augustus, Roxbury.
Parker, Charles W., Boston.
Parkman, Henry, Boston.
Parsons, John E., Lenox.
Partridge, Horace, North Cambridge.
Patten, Marcellus A., Tewksbury.
Paul, Alfred W., Dighton.
Peabody, Francis H., Boston.
Peabody, George A., Danvers.
Peabody, John E., Salem.
Peabody, S. Endicott, Salem.
Peck, O. H., Denver, Col.
Peek, William G , Arlington.
Peirce, Miss Marion W., Topsfield.
† Perry, George W., Malden.
Pfaff, Col. Charles, South Framingham.
Philbrick, William D., Newton Centre.
Phillips, John C., North Beverly.
Phillips, Mrs. John C., North Beverly.

Phillips, William, North Beverly.
Pierce, Dean, Brookline.
Pierce, Elisha N., Waltham.
Pierce, George Francis, Neponset.
Pond, Preston, Winchester.
Poor, John R., Brookline.
Pope, Col. Albert A., Cohasset.
Porter, Alexander S., Boston.
Porter, James C., Wollaston.
Porter, Hon. Joseph S., Washington, D. C.
Prang, Louis, Roxbury.
Pratt, Laban, Dorchester.
Pratt, Lucius G., West Newton.
Pratt, Robert M., Boston.
Prendergast, J. M., Boston.
Prescott, Eben C., New York, N. Y.
Pringle, Cyrus G., Charlotte, Vt.
Prouty, Gardner, Littleton.
Putnam, George, Manchester.
Putnam, George J., Brookline.
Putnam, Joshua H., Newton Centre.

Quinby, Hosea M., M.D., Worcester.

Raddin, Everett W., North Cambridge.
Rand, Miss Elizabeth L., Newton Highlands.
Rand, Harry S., North Cambridge.
Rand, Oliver J., Cambridgeport.
Rawson, Warren W., Arlington.
Ray, James F., Franklin.
Raymond, Walter, Boston.
Read, Charles A., Manchester.
Reardon, John B., Boston
Reed, Henry R., Jamaica Plain.
Rice, George C., Worcester.
Richards, John J., Boston.
Richardson, Charles E., Cambridge.
Richardson, Dr. William L., Boston.
Rinn, J. Ph., Boston.
Ripley, Charles, Dorchester.
Ripley, Ebed L., Hingham Centre.
Robbins, I. Gilbert, Melrose Highlands.
Robinson, John, Salem.
Robinson Joseph B , Dorchester.
Robinson, Warren J., Somerville.
Rogers, Mrs. Jacob C., Peabody.
Roland, Thomas, Nahant.
Roy, David Frank, Malden.
Ruddick, William H., M.D., South Boston.
Russell, George, Woburn.
Russell, James S., Milton.
Russell, Hon. John E., Leicester.
Russell, Walter, Arlington.

Salisbury, William C. G., Brookline.
Saltonstall, Richard M., Newton.
Sanford, Oliver S., Hyde Park.
Sanger, Mrs. George P., Boston.
Sargent, Andrew Robeson, Brookline.
Sargent, Charles S., Brookline.
Sargent, Mrs. Charles S., Brookline.
Sargent, Mrs. Francis W., Wellesley.
Sawtelle, Eli A., Boston.
Sawyer, Timothy T., Boston.
Scorgie, James C , Cambridge.
† Scott, Charles, Newton.
Sears, Miss Clara E., Boston.
Sears, Miss Emily E., Boston.
Sears, Dr. Henry F., Boston.
Sears, J. Montgomery, Boston.
Sears, Mrs. J. Montgomery, Boston.
Shaler, Nathaniel S., Cambridge.
Sharp, Miss Helen, Boston.
Shaw, Christopher C., Milford, N. H.
Shaw, Francis, Wayland.
Shaw, Mrs. Robert G., Wellesley.
Sherman, William H., Boston.
Shorey, John L., Lynn.
Shuman, Hon. A., Roxbury.
Sias, Charles D., Wenham.
Siebrecht, H. A., New Rochelle, N. Y.
Simpkins, Miss Mabel, Yarmouth.
Skinner, Francis, Boston.
Skinner, Francis, Jr., Boston.
Sleeper, Henry Davis, Boston.

Smith, Archibald, West Somerville.
Smith, Calvin W., Wellesley Hills.
Smith, Charles H., Newton Highlands.
Smith, Charles S., Lincoln.
Smith, Edward N., San Francisco, Cal.
Smith, George O., East Lexington.
Smith, Thomas Page, Waltham.
Snow, Eugene A., Melrose.
Snow, Samuel T., Cohasset.
Sohier, Col. William D., Beverly.
Souther, Charles H., Jamaica Plain.
Spaulding, Edward, West Newton.
Speare, Alden, Newton Centre.
Spooner, William H., Jamaica Plain.
Sprague, Hon. Charles F., Brookline.
Sprague, Isaac, Wellesley Hills.
Springall, George, Malden.
Stearns, Frank W., Newton.
Stedman, Henry R., M. D., Roslindale.
Stevens, Hon. Moses T., Andover.
Stewart, William J., Winchester.
Stone, Charles W., Boston.
Stone, Prof. George E., Amherst.
Stone, George F., Chestnut Hill.
Strater, Herman, Roxbury.
Strong, William C., Waban.
Swain, Charles E., Roxbury.
Sweet, Everell F., Malden.

Talbot, Mrs. I. Tisdale, Boston.
Tarbell, George G., M.D., Boston.
Taylor, Charles H., Boston.
Taylor, Horace B., Portland, Me.
Temple, Felker L., Boston.
Tenney, C. H., Methuen.
Thayer, Bayard, Lancaster.
Thayer, Mrs. Bayard, Lancaster.
Thayer, Eugene V. R., South Lancaster.
Thayer, Mrs. Eugene V. R., South Lancaster.
Thayer, John E., South Lancaster.
Thayer, Mrs. John E., South Lancaster.
Thayer, Nathaniel, Lancaster.
Thayer, Mrs. Nathaniel, Lancaster.
Thayer, S. V. R., Boston.
Thayer, Mrs. S. V. R., Boston.
Thiemann, Hermann, Manchester.
Thomas, W. B., Manchester.
Thurlow, Thomas C., West Newbury.
Tilton, Stephen W., Roxbury.
Todd, John, Hingham.
Tolman, Benjamin, Concord.
Tolman, Miss Harriet S., Boston.
Toppan, Roland W., Malden.
Torrey, Everett, Charlestown.
Tower, Miss Ellen May, Lexington.
Travis, Charles B., Brighton.
Trepess, Samuel J., Glencove, L. I., N. Y.
Tucker, Lawrence, Boston.
† Turner, John M., Dorchester.
Turner, Roswell W., Boston.

Vander-Woerd, Charles, Waltham.
Vaughan, William Warren, Boston.
Vinal, Miss Mary L., Somerville.

Wakefield, E. H., Cambridge.
Walcott, Henry P., M.D., Cambridge.
Waldo, C. Sidney, Jamaica Plain.
Wales, George O., Braintree.
Walker, Miss Mary Sophia, Waltham.
Walley, Mrs. W. P., Boston.
Walsh, Michael H., Wood's Holl.
Waltham, George C., Dorchester.
Walton, Daniel G., Wakefield.
Ward, Francis Jackson, Roxbury.
Ward, John, Newton Centre.
Ware, Benjamin P., Clifton.
Ware, Miss Mary L., Boston.
Warren, Samuel D., Dedham.
Washburn, Andrew, Hyde Hark.
Watson, Benjamin M., Jamaica Plain.

Watson, Thomas A., East Braintree.
Watts, Isaac, Waverly.
Webber, Aaron D., Boston.
Webster, Hollis, Cambridge,
Weld, Christopher Minot, Jamaica Plain.
Weld, George W., Boston.
Weld, Richard H., Boston.
Weld, Gen. Stephen M., Dedham.
West, Mrs. Maria L.. Neponset.
Weston, Seth, Chelsea.
Wheeler, Frank, Concord.
Wheeler, James, Brookline.
Wheeler, Wilfred, Concord.
Wheelwright, A. C., Brookline.
Wheelwright, Edmund M., Boston.
Whitcomb, William B., Medford.
White, Francis A., Brookline.
White, George R., Boston.
White, Joseph H., Brookline.
Whitney, Arthur E., Winchester.
Whitney, Ellerton P., Milton.
Whitney, Henry M., Cohasset.
Whittier, George E., Groton.
Whittier, William Benjamin, South Framingham.
Wigglesworth, George, Milton.
Wilbur, George B., West Newton.
Wilder, Edward Baker, Dorchester.
Wilder, Henry A., Malden.
Willard, E. W., Newport, R. I.
Wilcutt, Levi L., Brookline.
Williams, Miss Adelia Coffin, Roxbury.
Williams, Benjamin B., Boston.
Williams, John Davis, Boston.
Williams, Philander, Taunton.
Willis, George W., Chelsea.
Willis, Joshua C., Roxbury. .
Wilson, Col. Henry W., Boston.
Wilson, William Power, Boston.
Winthrop, Robert C., Jr., Boston.
Wood, Edmund M., Natick.
Wood, William K., West Newton.
Woods, Henry, Boston.
Wright, George C., West Acton.
Wright, John G., Brookline.
Wyman, Oliver B., Shrewsbury.
Wyman, Windsor H., North Abington.

ANNUAL MEMBERS.

Members of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly communicating to the Secretary the needed corrections.

Allen, Charles L., Floral Park, N.Y.
Alles, William H., Chestnut Hill.
Anderson, George M., Milton.
Arnold, Miss Sarah L., Newton Centre.
Atkinson, Edward, Brookline.
Ayres, Miss Helen F., Medford.

Badlam, William H., Dorchester.
Barker, John G., Melrose.
Barr, John, Wellesley.
Bigelow, Arthur J., Eastlake, Worcester.
Bigelow, Mrs. Nancy J., Southborough.
Bird, John L., Dorchester.
Blomberg, Carl, North Easton.
Bock, William A., North Cambridge.
Bolles, William P., M.D., Roxbury.
Boyden, Clarence F., Taunton.
Braman, George H., Newton.
Breck, Charles H., Newton.
Brunton, Frank, Newport, R. I.
Butler, Edward, Wellesley.

Carpenter, Frank O., West Roxbury.
Carter, Mrs. Sarah D. J., Wilmington.
Cary, Miss Alice B., Lexington.
Chase, Joseph S., Malden.
Chase, Leverett M., Roxbury.
Chase, Philip A., Lynn.
Chubbuck, Isaac Y., Roxbury.
Clapp, Henry L., Roxbury.
Clark, John W., North Hadley.
Clark, Joseph, Manchester.
Clark, Theodore M., Newtonville.
Clinkaberry, Henry T., Trenton, N. J.
Coffin, Abraham B., Winchester.
Collins, Frank S., Malden.
Comley, James, Lexington.
Coolidge, David H., Jr., Boston.
Coolidge, Dr. Sumner, East Watertown.
Cotter, Lawrence, Dorchester.
Cotting, Charles U., Boston.
Crosby, J. Allen, Jamaica Plain.
Curtis, Joseph H., Boston.
Curtis, Louville, Tyngsborough.

Davis, Frederick, Boston.
Davis, Frederick S., West Roxbury.
Dawson, Charles Jackson, Newark, N. J.
Derby, William H., Revere.
Dolbear, Mrs. Alice J., College Hill.
Doran, Enoch E., Brookline.
Dorr, George B., Boston.
Doyle, William E., East Cambridge.
Duffley, Daniel, Brookline.

Eastman, Edmund C., Brookline.
Eaton, Warren E., Reading.
Endicott, Miss Charlotte M , Canton.
Eustis, William Tracy, Brookline.
Ewell, Marshall F., Marshfield Hills.

Fenno, Warren, Revere.
Fisher, Sewell, Framingham.

Fitzgerald, Desmond, Brookline.
Fletcher, Fred W., Auburndale.
Forbes, William H., Jamaica Plain.
Francis, George E., M.D., Worcester.
Frost, Varnum, Arlington.
Fuller, T. Otis, Needham.

Gibbon, Mrs. James A., Boston.
Gill, Mrs. E. M., Medford.
Gilman, Hon. Virgil C., Nashua, N. H.
Grant, Charles E., Concord.
Grew, Henry Sturgis, Boston.
Grey, Robert Melrose, North Easton.
Grey, Thomas J., Chelsea.

Hall, Charles H., M.D., Corning, Cal.
Hall, Stacy, Boston.
Hallstram, Charles W., Boston.
Ham, Fernald E., Burlington.
Hargraves, William J., Jamaica Plain.
Harris, Frederick L., Wellesley.
Harrison, C. S., York, Nebraska.
Harrison, Thomas, Melrose Highlands.
Hartwell, Samuel, Lincoln.
Hatfield, T. D., Wellesley.
Hersey, Alfred H., Hingham.
Hersey, Edmund, Hingham.
Heustis, Warren H., Belmont.
Hill, J. Willard, Belmont.
Hinds, Warren D., Townsend.
Hobbs, George M., Boston.
Hollis, George, South Weymouth.
Houghton, George S., West Newton.
Howden, Thomas, Whitinsville.
Hubbard, F. Tracey, Cambridge.
Huston, Miss Katharine W., Jamaica Plain.

Ireland, Robert D., Winthrop.

James, Robert Kent, Dorchester.
Jameson, G. W., East Lexington.

Keith, Mrs. Mary R., Washington, D. C.
Kelsey, Harlan P., Boston.
Kemp, William S., Brookline.
Kennard, Frederic H., Brookline.
Kinney, H. R., Worcester.

Lancaster, Mrs. E. M., Roxbury.
Laurie, Robert, Newport, R. I.
Lawson, Joshua, Brookline.
Lincoln, Miss Agnes W., Medford.
Lomax, George H., Somerville.
Loring, Charles G., Boston.
Loring, William C., Beverly.
Lothrop, Thornton K., Boston.
Low, Hon. Aaron, Hingham.

Manda, W. A., South Orange, N. J.
Manning, A. Chandler, Reading.
Martin, William J, Milton.
Masten, Cornelius E., Dorchester.
Maynard, Charles, North Easton.
McLaren, Anthony, Westwood.
Meriam, Horatio C., D.M.D., Salem.
Metcalf, Dr. Ben H., Winthrop.
Milman, William, Roxbury.
Moody, Abner J., Boston.
Moore, George D., Arlington.
Morgan, George M., Boston.
Morison, George Abbot, Cambridge.
Morrison, William, Cohasset.
Moseley, Frederick C., Dorchester.
Moseley, Frederick Strong, Newburyport.
Munson, Prof. W. M., Orono, Me.

Newton, John F., Roxbury.
Nicholson, William, Framingham.
Norton, Michael H., Boston.
Norton, Patrick, Dorchester.

Olmsted, Frederick Law, Brookline.

Park, William D., Boston.
Parker, John, Newtonville.
Parker, Walter S., Reading.
Patterson, William, Quincy.
Pierce, George H., Concord Junction.

Petremant, Robert, Brooklyn, N. Y.
Pettigrew, John A., Jamaica Plain.
Pickman, Dudley L., Boston.
Pierce, Mrs. F. A., Brookline.
Plimpton, Willard P., West Newton.
Pray, James Sturgis, Cambridge.
Purdie, George A., Wellesley Hills.

Rea, Charles H., Norwood.
Rea, Frederic J., Norwood.
Rich, Miss Ruth G., Dorchester.
Rich, William E. C., Roxbury.
Rich, William P., Chelsea.
Richards, Mrs. P. D., West Medford.
Robb, Peter B., Whitinsville.
Robbins, Oliver R., Weston.
Robinson, Walter A., Arlington.
Rodman, Miss Mary, Concord.
Ross, Charles W., Newtonville.
Ross, Henry Wilson, Newtonville.
Rothwell, James E., Brookline.

Sander, Charles, Brookline.
Saunders, Miss Mary T., Salem.
Scott, Augustus E., Lexington.
Scudder, Samuel H., Cambridge.
Searles, E. F., Methuen.
Seaver, Edwin P., LL.D., Waban.
Sharples, Stephen P., Cambridge.
Shaw, Hon. Edward P., Newburyport.
Shepard Harvey N., Boston.
Sheppard, Edwin, Lowell.
Southworth, Edward, Quincy.
Squire, Miss Esther A., North Cambridge.
Stearns, Mrs. Charles A., East Watertown.
Stearns, Charles H., Brookline.
Stevens, Mrs. Mary L., Cambridge.
Stevens, Miss Mary O., North Andover.
Stone, Joshua C., Watertown.
Storer, Charles, Providence, R. I.
Story, Miss Sarah W., Brighton.
Strange, David T., Stoneham.
Sullivan, Michael, Revere.
Sutherland, George A., Roslindale.
Swan, Charles W., M.D., Brookline.

Tailby, Joseph, Wellesley.
Teele, William H., West Acton.
Thatcher, William. Brookline.
Tobey, Rufus T., Roxbury
Tyndale, Theodore H., Brookline.

Vaughan, J. C., Chicago, Ill.

Warren, Samuel H., Weston.
Welch, Patrick, Dorchester.
Westwood, Thomas H., Jamaica Plain.
Wheeler, Henry A , Newtonville.
White, Maurice P , Roxbury.
White, W. Henry, Lowell.
Whitney, Joseph, Cambridgeport.
Whiton, Hon. Starkes, Hingham Centre.
Wilkie Edward A., Newtonville.
Winter, William C., Mansfield.
Wolcott, Mrs. H. L. T., Dedham.
Wood, Mrs. Anna D., West Newton.
Wood, Elijah A., West Newton.
Wood, E. W., West Newton.
Woodford, Joseph H., Boston.
Woods, Henry F., Boston.

Young, E. Bentley, Boston.

Zirngiebel, Denys, Needham.

EXTRACTS FROM THE CONSTITUTION AND BY-LAWS.

SECTION XXII.

Life Members.

The payment of thirty dollars shall constitute a Life Membership, and exempt the member from all future assessments, and any Annual Member, having paid all dues, may become a Life Member by the payment of twenty dollars in addition thereto.

Annual Membership.

Every Annual Member, before he receives his diploma, or exercises the privileges of a member, shall pay the sum of ten dollars as an admission fee, and shall be subject afterwards to an annual assessment of two dollars.

SECTION XXIII.

Withdrawal or Discontinuance of Membership.

Any member may withdraw from the Society, on giving notice to the Treasurer and paying the amount due from him Any member who shall neglect for the space of two years to pay his annual assessment, after due notice from the Treasurer, shall cease to be a member. The Treasurer shall give notice of such withdrawals, or discontinuances to the Secretary, who shall erase such members' names from the list.

The attention of Annual Members is particularly called to Section XXIII.

HONORARY MEMBERS.

Members and correspondents of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor. by promptly communicating to the Secretary the needed corrections.

Information, or any clew to it, is especially desired in regard to Joseph Maxwell, *elected in* 1830, *and* George W. Smith, *elected in* 1851.

Hon. George S. Boutwell, Groton.

Clarence H. Clark, Ex-President of the Pennsylvania Horticultural Society, Philadelphia.

Joseph Jefferson, Buzzard's Bay.

Major L. A. Huguet-Latour, M. P., Montreal, Canada.

Sir Trevor Lawrence, President of the Royal Horticultural Society, London.

Joseph Maxwell, Rio Janeiro, Brazil.

Donald G. Mitchell, New Haven, Conn.

Hon. J. Sterling Morton, Ex-Secretary of Agriculture, Nebraska City, Neb.

Baron R. Von Osten Sacken, Heidelberg, Germany.

Samuel B. Parsons, Flushing, N. Y.

Dr. Henry S. Pritchett, President of the Massachusetts Institute of Technology, Boston.

George W. Smith, Boston.

Albert Viger, President of the National Society of Horticulture of France, Paris.

Hon. James Wilson, Secretary of Agriculture, Washington, D. C.

CORRESPONDING MEMBERS.

Members and correspondents of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly reporting to the Secretary the needed corrections.

Information, or any clew to it, is especially desired in regard to Alexander Burton, *elected in* 1829; S. Reynolds, M.D., 1832; *and* Francis Summerest (or Summerer), 1833.

ÉDOUARD ANDRÉ, Editor-in-chief of the Revue Horticole, Paris, France.

PROFESSOR L. H. BAILEY, Horticultural Department, Cornell University, Ithaca, N. Y.

JOHN GILBERT BAKER, F. R. S., F. L. S., Kew, England.

CHARLES BALTET, Président de la Société Horticole, Vigneronne, et Forestière de l' Aube, Troyes, France.

PETER BARR, London, England.

ARCHIBALD F. BARRON, Turnham Green, London, W.

NAPOLEON BAUMANN, Bolwiller, Alsace.

D. W. BEADLE, 303 Crawford St., Toronto, Ontario.

PROFESSOR WILLIAM J. BEAL, Agricultural College, Michigan.

PROSPER J. BERCKMANS, Ex-President of the American Pomological Society, Augusta, Ga.

CHARLES E. BESSEY, Ph. D., Professor of Botany in the Industrial College of the University of Nebraska, Lincoln.

DR. CH. BOLLE, Berlin, Prussia.

COL. GUSTAVUS B. BRACKETT, Pomologist to the United States Department of Agriculture, Washington, D. C.

JOHN CROUMBIE BROWN, LL.D., Haddington, Scotland.

PROFESSOR J. L. BUDD, Ames, Iowa.

WILLIAM BULL, Chelsea, England.

F. W. BURBIDGE, M.A., Trinity College Botanic Garden, Dublin, Ireland.

ALEXANDER BURTON, United States Consul at Cadiz, Spain, Philadelphia.

MAXIME CORNU, Director of the Jardin des Plantes, Paris, France.

DANIEL T. CURTIS, Dorchester.

REV. H. HONYWOOD D'OMBRAIN, Westwell Vicarage, Ashford, Kent, England.

SIR W. T. THISELTON DYER, K. C. M. G., F. R. S., Director of the Royal Botanic Gardens, Kew, England.

PARKER EARLE, President of the American Horticultural Society, Roswell, N. M.

GEORGE ELLWANGER, Rochester, N. Y.

HENRY JOHN ELWES, F. L. S., F. Z. S., Colesborn, Andoversford, Gloucestershire, England.

WILLIAM G. FARLOW, M.D., Professor of Cryptogamic Botany, Harvard University.

B. E. FERNOW, Forestry School, Cornell University, Ithaca, N. Y.

HON. ROBERT W. FURNAS, Ex-President of the Nebraska State Horticultural Society, Brownville.

BEVERLY T. GALLOWAY, Horticulturist and Superintendent of Gardens and Grounds of the United States Department of Agriculture, Washington, D.C.

CHARLES A. GOESSMANN, Ph.D., LL.D., Chemist of the Hatch Experiment Station of the Massachusetts Agricultural College, Amherst.

GEORGE L. GOODALE, M.D., Professor of Botany, Harvard University, Cambridge.

HENRY H. GOODELL, President of the Massachusetts Agricultural College, Amherst.

OBADIAH B. HADWEN, President of the Worcester County Horticultural Society, Worcester.

PROFESSOR BYRON D. HALSTED, Botanist and Horticulturist at the New Jersey Agricultural Experiment Station, New Brunswick, N. J.

PROFESSOR CARL HANSEN, of the Royal College of Agriculture, Copenhagen, Denmark.

J. H. HART, Superintendent of the Botanic Garden, Trinidad.

DR. F. M. HEXAMER, Editor of the American Agriculturist, New York.

J. W. HOFFMANN, Colored State University, Orangeburg, S. C.

J. C. HOLDING, Ex-Treasurer and Secretary of the Cape of Good Hope Agricultural Society, Cape Town, Africa.

THE VERY REV. S. REYNOLDS HOLE, D.D., Dean of Rochester, Rochester, England.

SIR JOSEPH HOOKER, K.C.S.I., The Camp, Sunningdale, England.

JOSIAH HOOPES, West Chester, Pa.

GEORGE HUSMANN, Napa, Cal.

CHARLES JOLY, Honorary Vice-President of the Société Nationale d'Horticulture de France, Paris.

SIR GEORGE KING, K. C. I. E., M. B., LL. D., F. R. S., Calcutta.

PROFESSOR WILLIAM R. LAZENBY, Department of Horticulture and Forestry; Secretary College of Agriculture and Domestic Science, Ohio State University, Columbus, O.

MAX LEICHTLIN, Baden-Baden, Germany.

VICTOR LEMOINE, Nancy, France.

DR. PETER MACOWAN, Director of the Botanic Garden, Cape Town, Africa.

DR. MAXWELL T. MASTERS, Editor of the Gardeners' Chronicle, London.

GEORGE MAW, Benthal, Kinley, Surrey, England.

T. C. MAXWELL, Geneva, N. Y.

THOMAS MEEHAN, Germantown, Pa.

DR. CHARLES MOHR, Mobile, Ala.

F. W. MOORE, A. L. S., Curator of the Royal Botanic Gardens, Glasnevin, Dublin, Ireland.

DR. DANIEL MORRIS, C.M G , D.Sc., M.A., F.L.S , Imperial Department of Agriculture, Barbados.

GEORGE NICHOLSON, Curator of the Royal Gardens, Kew, England.

PETER NØVIK, Secretary of the Norwegian Horticultural Society, Christiania.

WILLIAM PAUL, Waltham Cross, London, N.

PROFESSOR D. P. PENHALLOW, Director of the Botanic Garden, Montreal, Canada.

HENRY PROBASCO, Cincinnati, Ohio.

P. T. QUINN, Newark, N. J.

CAVALIÈRE ENRICO RAGUSA, Palermo, Sicily.

D. REDMOND, St. Nicholas, Florida.

S. REYNOLDS, M.D., Schenectady, N. Y.

BENJAMIN LINCOLN ROBINSON, Ph.D., Curator of the Gray Herbarium of Harvard University, Cambridge.

WILLIAM ROBINSON, Editor of Gardening Illustrated, London.

WILLIAM SALWAY, Superintendent of Spring Grove Cemetery, Cincinnati, O.

EDGAR SANDERS, Chicago, Ill.

WILLIAM R. SMITH, Superintendent of the Botanic Garden, Washington, D. C.

ROBERT W. STARR, Port William, N. S.

DR. JOSEPH STAYMAN, Leavenworth, Kan.

FRANCIS SUMMERest.

WILLIAM TRELEASE, Director of the Missouri Botanic Garden, St. Louis.

DR. MELCHIOR TREUB, Director of the Botanic Garden, Buitenzorg, Java.

H. J. VEITCH, Chelsea, England.

WILLIAM WATSON, Assistant Curator of the Royal Gardens, Kew, England.

EXPERIMENT STATION REPORTS WANTED.

The Massachusetts Horticultural Society is endeavoring to collect complete sets of the Bulletins and other publications of all the Agricultural Experiment Stations in the United States and Canada. Those named below are wanting, and any person having a spare copy will confer a favor by addressing the Librarian of the Society, Horticultural Hall, No. 101 Tremont Street, Boston.

Alabama (Ag. and Mech. College Station).— Bulletins 4–6 (1884), 7–10 and 1–4 (1885), and 5–9 (1886). 7th Annual Report, for 1894, and 9th, for 1896.

Alabama (Canebrake Station).— All Bulletins later than 18, and all Annual Reports later than the 3d, for 1890.

Arizona. — 4th Annual Report, for 1893.

Arkansas.— Bulletin 1. All Annual Reports later than the 4th, for 1891, except the 8th, for 1895.

California — Bulletins 32, 1878, and 1, 2, 3, 5, and 50, New Series.

Colorado.— Bulletin 3.

Connecticut (New Haven Station).—Bulletins 1 to 67, inclusive. Annual Reports for 1877 and 1879 to 1883, inclusive.

Florida.— Annual Report for 1892.

Indiana.— (Purdue Univ. School of Ag.). — Bulletin 1. College Reports 1 to 14, inclusive.

Kentucky.— Bulletin 10.

Michigan.— Special Bulletins 1, 3, and 5. 6th Annual Report, for 1892-93 (contained in Report of Michigan Board of Agriculture, 1893).

Missouri. — Bulletins 9, 13, 15, 16, 19, 20, 25, and 26 of Old Series. All Annual Reports since the 1st, for 1888, except those for 1896 to 1898, inclusive.

New Jersey.— Bulletins 1, 4, 5, 15, 27, and 28.

New Mexico.— Eighth College Catalogue, 1897–98.

New York (Cornell). — 1st Annual Report, 1881–82, and all between that and 1888, except the 2nd, for 1882-83 (Reports of Agricultural Department of Cornell University.)

North Carolina. — Bulletins 1 to 56, inclusive, and 69, 2d ed. 1st to 7th Biennial Reports. Meteorological Division, Bulletin 2 (68*b*). Special Bulletins 1 (77*a*) and 4 (82*a*). Weekly Weather Crop Bulletins 1–21, 1888; 1–24, 1889; 1–25, 1890; 2 and 4, 1891.

North Dakota.— 4th Annual Report, for 1893.

Ohio.— All Bulletins of First Series, except 16, 17, 18, and 19.

Oklahoma. — All Annual Reports previous to that for 1896–97, except that for 1893–94.

Pennsylvania. — Annual Reports for 1869, 1872, 1879–80, 1881, 1882, 1883, and 1884. [All issued by the State College.] Bulletin of Information No. 1.

South Carolina.— All Bulletins of the Old Series (previous to 1888) on the work of the Experimental Farm of the South Carolina College. 3d Annual Report, for 1890, and 6th, for 1893.

Texas.—College Bulletins 1–5, 1883-1887.

Virginia. — 10th Annual Report, for 1898-99.

Washington. — 6th, 7th, and 8th Annual Reports, for 1895–96, 1896–97, and 1897–98. All Bulletins later than 27.

West Virginia.— Special Bulletin — Potash and Paying Crops, 1890.

Wyoming.—Bulletins 2 to 4, 9, and 10.

Ontario Department of Agriculture, Toronto.—Bureau of Industries. — Agricultural Returns to the Ontario Bureau of Industries, Nov. 1882 (5th), Aug. 1883 (7th), and Nov. 1887 (20th).

TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1901.

PART I.

BOSTON:
PRINTED FOR THE SOCIETY.
1902.

☞ SEE LAST PAGE OF COVER.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

FOR THE YEAR 1901.

PART I.

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1902.

CONTENTS.

	PAGE
PREFATORY NOTE	3
BUSINESS MEETING, Jan. 5, 1901; Remarks of Vice-President Ware, introducing the President-elect, p. 5; President's Address, 6-10; Memorial of William Saunders, 11, 12; Report of Committee on Revision on Constitution, etc., presented, 12; action postponed, 13; Appropriations for 1901, 13, 14; Appointment of Treasurer, Secretary, etc., 14; Vote of thanks to Messrs. Kelway & Son, 14; Letters from F. H. Appleton and A. F. Estabrook, presenting vases, 14; Offer by Mrs. Sears of money for Prizes for Seedling Carnations, 14; Letter from William A. Taylor, Secretary of the American Pomological Society, read, 14; Reports of Committee on Lectures and Publication, and of Secretary and Librarian presented	14
MEETING FOR LECTURE AND DISCUSSION, Jan. 12; Evergreens for Winter Effect, by J. Woodward Manning, (Illustrated)	15-27
MEETING FOR LECTURE AND DISCUSSION, Jan. 19; The Trees of Our Neighborhood, by Miss Emma G. Cummings, pp. 28-40; Discussion . .	40-42
MEETING FOR LECTURE AND DISCUSSION, Jan. 26; A Visit to Kew Gardens and Hampton Court, by Benjamin P. Ware	42-49
BUSINESS MEETING, Feb. 2; Report of Committee on School Gardens, etc., presented, p. 50; Exhibitions to be omitted, 50; Letters from C. S. Sargent and William J. Stewart relative to time of opening new hall read, 50; Report of Sub-Committee on Meeting of the American Pomological Society, 50; Use of Society's Halls offered to Co-operative Flower Growers' Association, 51; Committee to procure portrait of Ex-President Appleton appointed, 51; Letter from Trustees of Paddock Building presenting statues and box in corner stone, and vote concerning marble tablets, 51; Six members elected	51
MEETING FOR LECTURE AND DISCUSSION, Feb. 9; Growing and Exhibiting Vegetables and Fruits, by Herbert R. Kinney, pp. 52-60; Discussion .	60-62
MEETING FOR LECTURE AND DISCUSSION, Feb. 16; The Advancement of Market Gardening in the Past Twenty-five Years, by Michael Sullivan, pp. 63-71; Discussion	71-74
MEETING FOR LECTURE AND DISCUSSION, Feb. 23; A Quarter Century's Evolution in American Horticulture, by Patrick O'Mara, pp. 74-88; Discussion	, 89

PAGE

BUSINESS MEETING, March 2; Thanks of Co-operative Flower Growers' Association reported, p. 90; Letter from Trustees of Paddock Building presenting marble tablets read, 90; Committee on Publication authorized to print Treasurer's Report as soon as approved, 90; Building Committee to take charge of removal of statues and tablets, 90; Library Committee authorized to remove library and library furniture and Superintendent to have charge of removal of other property, 90; Vote concerning condensed statements of Reports of Standing Committees, 90; Decease of Edwin C. Lewis announced, 90; and of Augustus Parker, 91; Decease of H. W. S. Cleveland announced, with remarks by the Secretary, and Vote of the Society, 91; Action in regard to death of John Galvin, 91; Three members elected 91

MEETING FOR LECTURE AND DISCUSSION, March 9; Fruit Growing in New England and its Development During the Last Fifty Years, by Hon. Aaron Low, pp. 92-104; Discussion 104-109

MEETING FOR LECTURE AND DISCUSSION, March 16; Studies of Some Tree-destroying Fungi, by Prof. George F. Atkinson 109-130

MEETING FOR LECTURE AND DISCUSSION, March 23; Twenty Years' Experience in Peach Growing, by John W. Clark, pp. 131 137; Discussion . 137-140

MEETING FOR LECTURE AND DISCUSSION, March 30; Insects Injurious to Fruits and Vegetables, by Prof. H. T. Fernald, pp. 141-143; Discussion 143, 144

The following lectures have been circulated to some extent in the form of slips reprinted from the reports made by the Secretary of the Society in the "Boston Evening Transcript." As here presented, the lectures are, as far as possible, printed in full, and reports of the discussions following the lectures are added, these, where it appeared necessary, having been carefully revised by the speakers.

The Committee on Lectures and Publication take this opportunity to repeat what they have before stated, that the Society is not to be held responsible for the certainty of the statements, the correctness of the opinions, or the accuracy of the nomenclature, in the lectures and discussions now or heretofore published, all of which must rest on the credit or judgment of the respective writers or speakers, the Society undertaking only to present these papers and discussions, or the substance of them, correctly.

AARON LOW,
J. H. BOWDITCH,
E. W. WOOD,
Committee on Lectures and Publication.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, January 5, 1901.

A duly notified stated meeting of the Society was holden today at eleven o'clock.

In the absence of President FRANCIS H. APPLETON, by reason of illness, the chair was taken by Vice-President BENJAMIN P. WARE, who introduced the President-elect in the following remarks:—

In the absence of the President it becomes my duty to call this meeting to order. In entering into a new year and a new century we are reminded of the important work that this Society has accomplished since its organization, nearly seventy-two years ago. Beginning in a small way, by persistent effort in advancing the science and art of horticulture and agriculture, we have made great improvement in the varieties and quality of flowers, fruits, and vegetables, and have taken a position second to no other Horticultural Society in this country. We commence the century under hopeful auspices for continued success with a new President who comes to us with a lifelong successful experience as a horticulturist and farmer; also as President of the Worcester County Horticultural Society. It is with pleasure that I introduce to you my friend, your President-elect, O. B. Hadwen.

President Hadwen then delivered his inaugural address, as follows:

ADDRESS OF PRESIDENT HADWEN.

Ladies and Gentlemen,

Members of the Massachusetts Horticultural Society:

May I extend to you all a happy greeting for the New Year, and express the wish that the usefulness of the Society may in the New Century not only equal but surpass that of the century now closing.

The result of your annual election calls me to a duty to which I had never aspired, and which I have never sought or expected. I do not regard my election as a compliment to myself, but rather as an expression of the wish of the members that the Society may continue under wholesome by-laws, which for many years have contributed to govern the Society, and to secure the confidence of its members in the progressive work which it was incorporated to carry forward, and we may be encouraged with the feeling that it may continue as in the many past years to promote the best interest pertaining to horticultural pursuits, and to advance the science and practice of horticulture within its jurisdiction.

I recall with very great significance the work that has been accomplished within the last fifty years in all departments of horticulture, and while our fields may not be as broad as at the start, it is a satisfaction to believe there is no end to horticultural advancement, as there is no end to nature's progress.

I come to discharge my official duties to the Society with but little experience in its administration, and with but little acquaintance with the varied and complicated questions which must necessarily arise during this year in changing from our old and venerated hall to the new one now in course of construction, and while the change is inevitable I can see no way but for each and every member of the Society to work in harmony and make the best of our situation, hoping that our efforts will be crowned with success, and remembering the noble men and great benefactors that have preceded us.

And should we not ascribe much of the achievements and prosperity of this Society, and the advances made towards the object for which it was incorporated, to the energy and zeal of the men and women who have proved their devotion to it for many years by their exhibitions of Fruits and Flowers and Vegetables?

Let me most sincerely thank you for the honor you have conferred upon me by asking me to preside over the deliberations of this Society the present year, following such a corps of noble men and women who have devoted their time and means to the development of horticulture, as a science and art since its incorporation.

Since that time an almost entire revolution has taken place in the principles and practice which has been brought out every year.

When the little colony of men who were the founders of the Massachusetts Horticultural Society held their first meeting on Feb. 24, 1829, they could but imperfectly realize the progress the Society would make in the seventy-two years of the nineteenth century, starting at a period when knowledge of the science and art of horticulture had barely dawned.

But they gave their energies to the progress of horticulture, and nearly three-quarters of the nineteenth century has marked an epoch in the science of horticulture, not only in this Commonwealth but over the whole country. An industry, vast in its extent, and accompanied by an intelligent knowledge previously not possessed in the growing of fruits, flowers, and vegetables that supply the demands and wants of an educated and discriminating people, has been built up.

It is seventy-two years since the first meeting of the Society, held on February 24, 1829.

On the 28th of April the Society voted to petition the legislature for an act of incorporation, which was granted, and approved June 12, 1829, by Levi Lincoln, Governor, authorizing the Society, to purchase and hold real estate to the amount of ten thousand dollars, and personal estate to the amount of twenty thousand dollars, which has been increased from time to time by legislative enactment to a million dollars.

The Society occupied and held its exhibitions in a number of halls, until, in 1845, it built its first Horticultural Hall on School Street, which, as time rolled on and horticultural progress increased, became crowded to such an extent that larger quarters were found imperative, and in 1865 this hall in which we are now assembled was finished and dedicated to the future use of the

Society. It is here in this temple dedicated to horticulture that for a period of thirty-six years the Society has achieved its greatest success, unequalled, both in the practice and the science of horticulture, in any corresponding period in the country's history. The ten gentlemen constituting the building committee have all gone to their reward, save one—for many years a most notable, public-spirited benefactor to horticultural and arboreal progress.

The most prominent event of the past year is the vote which authorized the sale of this hall and the removal to the new building now being erected by the Society and expected to be in readiness for occupancy on May 1st. Many will leave this hall with feelings of deep regret, for it is here very many interesting exhibitions and meetings have taken place, where very many new fruits, flowers, and vegetables have been introduced, for the first time, to the public, and their merits have received approval, and where our associations have continued instructive and pleasant.

Heretofore, each removal of the Society has added renewed lustre to the growth of horticulture in its earlier progress. When in the new building, may we hope to show by practical demonstration that the best horticulture of the world is none too good for us, and may we keep abreast of the times with the best work pertaining to our interests. When removed to the new building let us profit by the example of the men of noble deed who have preceded us, and let the progress of the future be in a corresponding ratio with the past. It must be our study to know what course to pursue to best promote its influence. There must be united and harmonious action among us or we cannot maintain the standing which we have so long enjoyed and which has built this Society up to its present position—one of the best on this continent—and though its members by their noble deeds have continued its progress from the beginning by devoted industry, and by courageous and persistent efforts and by liberal bequests have brought the state and country from comparative ignorance to enjoy the higher arts of horticulture.

I cannot speak fittingly of all the changes or advances made by the influences of the Society, and the intelligent energy which many cultivators have devoted to the introduction of new fruits both native and foreign. There was a period when the exhibition

tables were covered with hundreds of sorts of pears, which ultimately proved a costly experience to the enthusiasm of some growers, but a valuable object lesson to the society and to those growing pears for the profit. We have had the same experience with the apples, the peaches, the plums, the grapes, as well as the smaller fruits.

But now the prize lists, revised yearly, contain all found worthy of encouragement or cultivation, and adapted to the climate. Truly as much interest has been manifested in the introduction and cultivation of flowering plants; all that promise well receive a trial, and our plant houses and grounds contain the best to be found the world over. Many new plants from seed are shown every season which often receive the Society's gold and silver medals.

And the improvement in vegetables perhaps has enlisted as growing interest as either fruits or flowers. Very many new and approved sorts are yearly exhibited, each seemingly an improvement of its respective kind, and the question may fairly arise, is the end ever to be reached as long as nature can be assisted with the intelligence of man, and the great forces of nature become better understood? It would seem that a natural law exists whereby each kind of fruit or flower is endowed with a natural period of life, prolonged by care and cultivation, or shortened by the want of it.

Horticulture as a vocation and business is improving our lands to a wonderful extent, increasing the crops grown upon them; it is beautifying homes and landscapes; it embellishes homes with beautiful trees and flowers which are always a delight, not only to the family but to the passer-by. A beautiful home refines its inmates, gives better rational life and more of it, and is the very cornerstone that higher life and civilization rests upon.

Arboriculture or Forestry is also one of the branches in which we are interested. The finer deciduous and coniferous trees, both indigenous and exotic, are constantly being introduced and planted for the embellishment of homes and estates.

The requisite knowledge we have obtained of tree planting is giving great advantage in selection of kinds best adapted to the soil and climate, and while forest planting has not enlisted much attention in this Commonwealth, either by individuals or by cor-

porations, still it would seem that state and towns should issue bonds for the purchase of abandoned or cheap lands unsuitable for other husbandry, when forest industry could change thousands of acres situated in this Commonwealth from waste to productive forests—lands with a profit accruing to the state, contributing both a better climate and a lumber supply which is growing scarcer and dearer as time goes on.

Now ladies and gentlemen, members of the Society, I have time to speak of but few of the interests pertaining to the Society, but with the large membership, with the large wealth, with the early prospect of a new building, with enlarged accommodations for the library, commodious halls for exhibitions and lectures, with all the modern conveniences which ingenuity can devise, very much will be expected. Need I say that the most important steps to be taken are those that will promote peace and harmony? These are fundamental to our future usefulness; there must be united and harmonious action for our progress, or we make the retrograde movement so disastrous to our prosperity and welfare.

Let us begin the new century and the new year with the firm resolve that the spirit of union and concord shall ever remain the prominent light to which our course shall ever be directed.

It will require a full allowance of aptitude and common sense to meet fairly the exigency of removal, in adapting ourselves to the new building; undoubtedly there may be some conditions other than have been expected.

It will be a year of new experiences requiring considerable adaptability in the management of all departments to work smoothly and without friction. May we hope that each department will, as far as possible, correctly outline the course of procedure to ensure success.

But whatever may be our action let the love of our Society preponderate and be carried forward with that perseverance and zeal which actuated the earlier members who preceded us, and builded it to its present standing among the Horticultural Societies of the world.

I have thus endeavored, ladies and gentlemen, briefly to speak to you in my plain way, let me hope not entirely inconsistent with the time and spirit of the occasion; and for the honor of your presence I thank you.

Benjamin P. Ware, Chairman of the Committee appointed on the first of December to prepare a memorial of William Saunders, presented the following:

William Saunders, of Washington, D. C., since January 9, 1875, a Corresponding Member of this Society, passed on to his spiritual life on the 11th of September last. He was born at St. Andrews, Fifeshire, Scotland, December 7, 1822. His career has been most remarkable as a leader and organizer in his chosen calling of gardening. For three generations his ancestors had been distinguished gardeners in Scotland. He began as an apprentice, at sixteen years of age, under the instructions of the most noted horticulturists there. In 1845 he came to New York, and was first employed by Johns Hopkins, the founder of the University bearing his name, in laying out his estate of four hundred acres, called Clifton Park.

In 1854 he united with Thomas Meehan, at Germantown, Penn., as landscape artist and garden architect, and he designed Hunting and Fairmount Parks in Philadelphia. At this time Mr. Saunders was one of the principal writers on horticultural subjects, as many of us well remember. In 1862, when the Department of Agriculture was established, his ability was recognized, and he was appointed Horticulturist and Superintendent of Gardens and Grounds, which position he held to the time of his death, and it is admitted that the Department has not nearly exhausted the valuable suggestions which he made years before it began the work of park embellishment.

As President of the Park Commissioners of Washington he gave of his rich knowledge and experience the designs for planting that have been continued from year to year under his personal care, until the grounds about the capitol have the grandeur of a natural forest and yet show the skill of an artist in the selection and arrangement of tree planting that commands the admiration of the thousands of yearly visitors.

Mr. Saunders designed the beautiful cemeteries at Amboy and Rahway, N. J., Bethlehem, Penn., Chicago and Springfield, Ill., and also the magnificent National Soldiers' Cemetery at Gettysburgh. He was selected by Gen. Grant to design the Park surrounding the Lincoln monument at Springfield, Ill. Through his

influence thousands of plants have been introduced into this country for experimental purposes, and probably the most important and valuable fruit ever brought from any other country was the Navel or Seedless orange, which he imported from Brazil in 1870, and by propagating liberally was enabled in 1873 to give a few plants to a settler in Southern California. The original imported tree is now in the greenhouse of the Department. Today there are thousands of acres devoted to the culture of this, the best orange for the markets all over this country.

William Saunders was the first man who suggested to the farmers of the United States the value and importance of organizing for their mutual advancement, educationally, socially, and financially; hence came the organization of the Patrons of Husbandry. He was elected the first Master of the National Grange; he wrote the preamble of its constitution, which has never been altered, and by it thousands of farmers' families have been benefitted as in no other way possible.

In consideration of this memorial

Resolved, That the Massachusetts Horticultural Society fully appreciates the great value of the life work of William Saunders to the horticultural and agricultural interests of the whole country. And especially do we mourn his loss to this Society as a beloved and highly esteemed member.

Resolved, That this memorial be printed in our TRANSACTIONS, and that a copy be sent to his bereaved family.

BENJAMIN P. WARE,
AARON LOW,
J. WOODWARD MANNING,
Committee.

The memorial was unanimously adopted.

Augustus P. Loring, Esq., from the Committee on the Revision of the Constitution and By-Laws, presented the report of that Committee in print, and explained the new By-Laws proposed. It was moved and seconded that the report be accepted and this motion was carried.

It was moved and seconded that when the vote on the adoption of the proposed code of By-Laws is taken, it be taken by ballot, with the use of the check list, and this motion was carried.

It was voted to take up the report of the Committee section by section, beginning with the "Preliminary" portion.

A motion that speakers be limited to five minutes each was defeated.

A motion that the subject be indefinitely postponed was defeated by a vote of 31 in favor to 59 against.

A motion that it be postponed until the first Saturday in October was carried by a vote of 43 in favor to 40 against.

The appropriations recommended by the Executive Committee at the meetings of the Society on the 3d of November and the 1st of December, 1900, came up today for final action, as follows:—

For Prizes and Gratuities for the year 1901,

For Plants	$2,000.00
" Flowers	2,500.00
" Fruits	1,700.00
" Vegetables	1,200.00
" Gardens	500.00
" Native Plants	175.00
Total	$8,075.00

For the Committee on School Gardens and Children's Herbariums, for Prizes	$125.00
For the same Committee for Incidental Expenses	75.00

At the meeting of the Executive Committee on the 29th of December it was voted to recommend to the Society to make the following appropriations:

For the Library Committee, this sum to include the income of the French and Farlow Funds	$700.00
For the Committee of Arrangements, this sum to include all extraordinary expenses of said Committee	300.00
For the Committee on Forestry and Roadside Improvement	150.00

For the salaries of the Treasurer and Superintendent of the Building, and the Secretary and Librarian $3,000.00

For the Committee on Lectures and Publication, this sum to include the income of $50 from the John Lewis Russell Fund 250.00

(The last appropriation was recommended by the Executive Committee on the 29th of November.)

The report was accepted and the appropriations were voted.

The President also reported the appointment by the Executive Committee of Charles E. Richardson as Treasurer and Superintendent of the Building, and Robert Manning as Secretary and Librarian for the year 1901.

On motion of William J. Stewart it was voted that the thanks of the Society be presented to Messrs. Kelway & Son of Langport, England, for their generous gift of medals as prizes for pæonies during the present and the last three years.

Letters were read from Ex-President Francis H. Appleton, and Arthur F. Estabrook, each presenting, for use in the new building, one of a pair of large and elegant vases loaned for the last chrysanthemum show by the Jones, McDuffie & Stratton Company. The thanks of the Society were unanimously voted to the givers for these adornments of our exhibition halls.

The Secretary read a letter from Charles S. Sargent to Ex-President Appleton conveying the offer by Mrs. J. Montgomery Sears of the sum of $350 to be used for a first and second prize for Seedling Carnations. The thanks of the Society were unanimously voted for this liberal gift.

A letter from William A. Taylor, Secretary of the American Pomological Society, in relation to the biennial session of that Society the present year, was read and referred to the Executive Committee.

The Annual Report of the Committee on Lectures and Publication and the Annual Report of the Secretary and Librarian were presented and referred to the Committee on Publication.

Adjourned to Saturday, February 2.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, January 12, 1901.

A Meeting for Lecture and Discussion was holden today at eleven o'clock, the President, O. B. HADWEN, in the chair.

The following lecture was delivered:

EVERGREENS FOR WINTER EFFECT.

By J. WOODWARD MANNING, Reading.

In considering a list of hardy evergreen trees and shrubs, useful for winter landscape effect, the intention is to include besides conifers those classes of broader-leaved evergreens of tree, shrub, and vine habit which are as yet seldom associated with conifers for this purpose. These include such kinds as Hollies, Rhododendrons, Azaleas, Laurels, Ivies, etc., some of which combine with their evergreen foliage a wealth of flower effect as well, rendering them useful in landscapes at all times of the year, and the intention is to bring together here a rather complete list of these plants and show how it is thus possible to extend their use and produce beautiful foliage effects throughout the winter months.

First considering the larger growing conifers, we have besides the White Pine (*Pinus Strobus*), so well known to us as our most valuable as well as most ornamental native, a selection of foreign Pines which have much of the same general effect of growth and similar foliage as *P. Strobus*, among which are the Japanese species, *P. Thunbergii*, varying in effect from the last in a somewhat more open habit and darker foliage; *P. parviflora*, of dwarfer habit, with shorter foliage in smaller tufts, and with bark of a greyish tone of color; *P. densiflora*, another Japanese species with soft dark green foliage and flaky reddish bark; the Himalayan species, *P. excelsa*, the most beautiful of the class, with densely clothed branches of a distinct pendulous habit and very long, somewhat drooping, pale glaucous green leaves in large showy tufts; the American *P. Lambertiana*, similar to the White Pine but with more densely clothed branches and a more

strictly conical habit; *P. Cembra*, from the Alps of Europe, with rich green, densely tufted foliage and a very close, rounded, ovate habit; and *P. Bungeana*, a North China species of rounded habit of growth and thinly branched with densely tufted foliage and remarkably light colored bark, milky white in effect. All of these are hardy and useful for variety.

Taking another type represented by *P. resinosa*, our native Norway or Red Pine, we have a similar though distinct effect of heavy growth and long, dark green, densely-tufted foliage in the Austrian Pine (*P. Laricio* var. *Austriaca*) and its typical form known as the Corsican Pine (*P. Laricio*), the Japanese *P. Koraiensis*, a species of smaller growth, and the West American *P. ponderosa*, which, while a most important tree in the central and far western states, does not succeed as satisfactorily in our vicinity. It is a dense growing tree with dense tufts of long, dark green foliage. All the species mentioned under this type are of comparatively rapid growth and in their younger stages, when the lower branches are retained, form most useful specimen lawn trees.

We are prone to neglect our native Pitch Pine (*P. rigida*) which, while somewhat difficult to transplant, when once well established forms a tree capable of withstanding our most exposed seashore and inland conditions and will adapt itself to poor soils. It is, too, more apt to take on picturesque forms than any other native, often giving that peculiar, irregularly round-topped, bare-trunked effect that is so commonly associated with Italian views in which the European Rock Pine (*P. Pinea*) forms a more or less salient point. Other species of larger-growing Pines adapted to our climate and similar in effect to the Pitch Pine are the *P. contorta* of the West, the *P. tydœa* of southern New England, and *P. pungens* or the Table Mountain Pine of the mountains of North Carolina. The Scotch Pine (*P. sylvestris*) is a well known and highly useful form for dry, sterile soils, but is not as long-lived or as generally satisfactory as some other species, though very generally used in landscape planting.

In Pines of dwarfer stature than those mentioned, the Mountain Pine (*P. montana* or *Mughus*) figures as a useful lawn tree of rounded, compact habit of growth, very useful for planting in

Picea alba var. cœrulea.

sterile soils under all conditions of exposure. To attain further dwarfed effects in Pine growth we have recourse to the dwarf forms of *P. Strobus*, *P. sylvestris*, and *P. Massoniana*, the latter also producing two remarkable golden leaved varieties known as the Golden and the Sun Ray Japanese Pines.

Of Spruces, a plea should be entered here for our native species as in many respects best adapted for general New England conditions, and yet these have been largely overlooked, and the foreign varieties planted where the natives would have done better. The Red Spruce is an instance to the point, in which we have a moderately quick growing tree with light green foliage, reddish stems, and a ruggedness of character that ensures its successful use in seashore and other exposed situations, and our White Spruce, (*Picea alba*) is in many respects our most ornamental evergreen, combining, as it does, absolute hardihood with elegant form and a tendency to retain its lower branches better than any other evergreen, while it shows wide variation in the color of its foliage, in some instances its glaucous types proving rivals to the best form of *P. pungens* (the Rocky Mountain Blue Spruce.) While it is not as rapid in growth as the Norway Spruce (*P. excelsa*) it does possess the merit of longevity and none of the early deterioration that the latter does. The Rocky Mountain Blue Spruce has become well known and is a most useful lawn tree, though after twenty or thirty years it begins to lose that symmetry in form that at first recommends it for lawn planting. It is a mistake to expect any evergreen to show at maturity the symmetry that is usual in its juvenile stages. Many assume a distinct ornamental habit with age but are liable to demand much room for their development, and if this maturity is desired, room for such development must be allowed, thus requiring grounds of broad extent. Other spruces of high ornamental merit and American origin are the Menzies Spruce from Colorado, *P. sitchensis* or *Menziesii*, a dense growing, short leaved species from the Northwest; *P. nigra*, the Black Spruce, which is one of our most abundant northern species, comprising the major source of lumber supply for the East and well adapted for seashore planting, and *P. Engelmannii* from the Rocky Mountains, nearly like the Rocky Mountain Blue Spruce but with less rigid foliage, a tree bound to be of great value in future plant-

ing. From Japan, *P. polita*, the Tiger-tail Spruce, is a most distinct species, with very long, rigid, spiny foliage, thickly set around the branches, and with a distinct habit combining rapid, pyramidal growth with a semi-pendulous tendency of the branchlets. *P. ajanensis* and *P. Alcockiana* are similar in effect, of dense, small branched habit in youth, with short foliage thickly set on the branches; but the latter species is particularly noteworthy in the distinct silvery cast of the under surface of the foliage, and the former species in the brilliant crimson color of its young cones. Both have a distinct upward tendency of the branches and make beautiful lawn trees. The rare and beautiful *Picea Smithiana*, from Asia, is distinct in habit from any other species; the foliage is of a silvery green and the habit is decidedly pendulous in all stages. A native of the temperate regions of the Himalayas, it is one of our most remarkable hardy ornamental trees and can be grown successfully in warm, somewhat sheltered situations. To Europe we are indebted for the Norway Spruce (*P. excelsa*), the Oriental Spruce (*P. orientalis*), and the rare *P. Omorika*. The first has been planted more than any other species and for easy culture, rapid growth and hardihood has no rival. Unfortunately it will not stand smoky atmospheres, or dry situations, and under such circumstances is short lived and becomes more or less unsightly. However, some of our finest winter effects at present depend largely on this species, and probably for many years this will have a wide popularity. This species, too, is more prolific in varieties than any other, and the Golden-tipped, Finedon Hall variety, the pendulous *P. e. pendula*, the weeping *P. e. inverta*, the long branched, grotesque form known as *P. e. monstrosa*, the open habited *P. e. alata*, and the angular branched *P. e. eremita*, are noteworthy among the larger growing varieties, while in dwarfer forms such as *P. e. Ellwangeriana*, *P. e. dumosa*, *P. e. Clanbrasiliana*, *P. e. Gregoryana*, *P. e. pumila*, and *P. e. pygmæa*, the habit becomes dwarfed until the last mentioned varieties form but carpets of dense, thickly tufted foliage. A collection of varieties of the Norway Spruce alone would go far toward producing a varied and evergreen winter effect on any private grounds.

P. obovata is a species rather closely associated with the Norway

Tsuga Canadensis var. nana.

Tsuga Sieboldii.

Spruce, having a more slender growth and pendulous habit. *P. orientalis* is a most beautiful species, of densest habit, with very dark, thickly set foliage and slender branched growth, and a most useful lawn tree, somewhat slow in assuming a leader but eventually proving hardy in all but abnormally unfavorable conditions. *P. Omorika* on the other hand, while hardy, is seldom seen in New England and is confined to small, isolated areas in its native Servian habitat. Of slow growth when young, it is most interesting at present from its rarity.

Of Hemlocks the variety is greater than is ordinarily understood, for while the *Tsuga Canadensis* is a native of highest ornamental value, the Carolina Hemlock, (*T. Caroliniana*) is very distinct in habit, less dense in growth, and with broader, longer foliage. The Japanese *T. Sieboldii* in its youthful stage is a very upright species with short, dark green, thickly set foliage, while *T. diversifolia*, also Japanese, has even shorter, darker foliage, reddish bark, and a more slender habit. Western America produces two other species in *T. Mertensiana*, of very dense, upright habit, and *T. Albertiana*, similar in many respects to our native species but of more rapid growth. These two species form extensive forests in Oregon and Alaska and constitute a valuable timber supply. While all the species of Hemlocks are distinct, yet our native species will always be of greatest value for ornamental planting, combining hardihood, beautiful foliage, and graceful habit with ease of transplanting; this species is also rather prolific in varieties, of which the Sargent's Weeping Hemlock (*T. C.* var. *Sargenti pendula*) is a graceful tree of drooping habit. *T. Canadensis* var. *parvifolia*, of dense upright habit with dark green foliage; *T. C.* var. *alba spica*, oddly variegated with silvery spots; and *T. C.* var. *globosa*, of dense rounded growth, are examples.

The Douglas Fir (*Abietia Douglasii*) is one of our finest American species and forms the connecting link between the Spruces and Hemlocks. A native of the western states, where it forms immense forests of most valuable lumber, it takes kindly to our eastern soil and is a most ornamental species, preserving its lower branches to extreme age. The habit varies from a dense, broadly pyramidal tree with soft green foliage

to pendulous forms and silvery casts of color. It will hold its own in public appreciation as one of the most desirable of ornamental lawn trees.

In the Firs we have less diversity in habit than in other large conifers, but a number of species are hardy in our climate and can be recommended. For general planting the Silver Fir (*Abies concolor*), the Veitch's Fir (*A. Veitchii*) and Nordmann's Fir (*A. Nordmanniana*) will undoubtedly hold best in popular consideration and prove most valuable. Of our native species *A. balsamea* is rather short lived and seems to resent isolated planting. *A. Fraseri*, from the Southern Alleghanies, seems more permanent as a lawn tree and its distinction is that of denser growth and more thickly set foliage. A dwarf variety of our native Balsam Fir, (*A. b.*, var. *Hudsonica*) becomes a thickly branched evergreen shrub rarely exceeding a yard in height. Western America is very prolific in species of Firs of which the Silver Fir (*A. concolor*) aforementioned is truly a prince of trees, being of rapid growth with beautiful, long, thickly set foliage, varying from soft green to most showy silvery casts, and combining as well considerable variegation in general habit effect. No tree excites greater admiration than a good specimen of the Concolor Fir.

Other western species are *A. grandis*, less robust than others; *A. magnifica*, of columnar habit with a peculiar perpendicular arrangement of the foliage on the branchlets; *A. nobilis*, of dense heavy growth with beautiful foliage varying in color from dark green to silvery blue; and *A. lasiocarpa*, closely allied but inferior to the *concolor*. These last named are all less hardy than the *concolor*. From Japan, besides that beautiful Veitch's Fir (*A. Veitchii*) of rapid growth with rich, glossy green foliage comes the *A. homolepis* or *brachyphylla*, similar in general effect and equally beautiful though rare; but *A. firma* is distinct in its flat, whorled, more conical habit and peculiarly notched, dark green foliage.

From Southwest Europe we obtain the Nordmann's Fir with its rich, glossy, thick set foliage and beautifully symmetrical habit; but the range of species includes also the Cephalonian and Cilician Firs (*A. Cephalonica* and *A. Cilicica*) of broad habit, with sharp dense foliage and a peculiar upright tendency of the branches, and

Abietia Douglasii.

Juniperus Chinensis var. alba spica.

the Pinsapo Fir (*A. Pinsapo*) from the Sierras of Spain, of upright, densely branched growth with leaves of needle-like sharpness. The Common English Silver Fir (*A. pectinata*) seems similar to the American Silver Fir in its lack of adaptability to isolated planting; yet its weeping variety (*A. p. pendula*) thrives under proper conditions and is noteworthy for its grotesque ornamental effect.

The trees which have been mentioned are, with the exception of the dwarf varieties, of large size, requiring ample lawn space for full development, but as we pass to the Junipers and Cedars, Yews and Arbor Vitæs, we find trees of dwarfer stature or more columnar habit, that can be used to advantage on more restricted lawns.

Junipers, while comprising no very large growing trees, do combine great variation in habit with coloring of foliage, and are most valuable for grouping. Our ordinary Red Cedar, *Juniperus Virginiana*, is not as fully appreciated as it should be. In habit the tree varies from straight columnar to broadly pyramidal and weeping types, and the foliage ranges from deepest green to silvery and golden tones. The types recognized in nurseries at present include *J. V. pendula*, of drooping habit; *J. V. Schotti*, of upright columnar growth with light pea-green foliage; *J. V. tripartita*, with crested, densely branched habit; *J. V. alba spica*, a silver variegated form; and *J. V. glauca* or *elegans*, with distinct silvery hue. The Chinese Junipers are of dense columnar growth with glaucous foliage, showing in their varieties peculiar silvery blotch-like variegations (*J. Chinensis alba variegata*); or they are richly tinged with golden yellow as in *J. C. aurea*. A choice Japanese species, *J. Japonica*, is very distinct from the last in its fine, soft foliage, of deepest green in the type, with silver and gold variegations (*J. J.* var. *fœmina variegata* and *J. J. aurea variegata*). *J. excelsa* of Europe and Asia forms a medium sized tree of upright, conical habit with foliage somewhat similar to the American Juniper. *J. recurva*, of the sub-arctic Himalayas, is striking in its pendulous tendency and the foliage has a peculiar reddish tone, while the bark is conspicuously red. *J. drupacea* of southern Europe succeeds under favorable soil conditions and is distinct in its sharp, light green foliage set at right angles to the branchlets

and also in its abnormally large fruits. While those mentioned are generally of tree-like growth, the dwarf and prostrate forms are useful for grouping and covering effects. Our well known creeping or Savin Juniper (*J. procumbens*) is being extensively planted and the variety *aurea* with bright golden summer foliage is of value for contrast. *J. Sabina* is equally useful for low planting and its natural habit of densely covering the ground with its matlike branches is a suggestion of nature that is being copied by the landscape gardener. This too has distinct varieties in *J. S. tamariscifolia*, with darker foliage and broadly spreading, shrubby growth; the silvery variegated form (*J. S. variegata*), and a form known among nurserymen as the Waukegan Juniper, in which the foliage is of a rich bronzy green and the plant grows to a broad cup-like shape. Another distinct class of Junipers is represented by the Irish Juniper (*J. communis*, var. *Hibernica*) which forms a small columnar tree of light, soft green foliage effect, but the Swedish Juniper, another variety, is considerably hardier than the Irish.

Arbor Vitæs, locally known as Red Cedar, (*Thuya occidentalis*) have proved of great value in their use for screens and hedges, but are not as frequently grouped for their individual beauty as they should be. A specimen plant clothed completely to the ground is a really beautiful object. No conifer has proved more prolific in varieties, and the range in color and habit is remarkable, varying from darkest shades of green to silver and golden forms, and from strict columnar habit to weeping, globular, and prostrate growths. Of these the most valuable would include *T. o. ericoides*, *T. o. lutea*, *T. o.* George Peabody, *T. o. pendula*, *T. o. plicata*, *T. o. Spathæ*, *T. o. Vervæneana*, *T. o. Wareana* (*Sibirica.*)

Other species of Thuya include the Oriental Arbor Vitæ (*T. orientalis*) with lighter, more columnar habit than our common Arbor Vitæ and with golden and other varieties. Then our western species, *T. dolabrata*, is hardy under proper soil conditions and is very distinct in its foliage and general effect. This, too, has a distinct form in the silver leaved *T. d.* var. *variegata*. *T. Japonica*, of graceful habit, and *T. gigantea*, of columnar, massive growth, are not as generally hardy as the previously mentioned species.

Juniperus Sabina var. procumbens.

Thuya occidentalis var. aurea.

The Cypresses are another valuable class, comprising many varieties not adapted to our soils and climatic conditions, the Lawson's Cypress (*Cupressus Lawsoniana*) being an example of which the type and the variety *erectis viridis* alone can be grown here, and then only under special conditions. The Nootka Sound Arbor Vitæ (*C. Nootkatensis*) is somewhat hardier. On the other hand, most of the Japanese Cypresses known as Retinosporas succeed well in all but intensely sunny, wind-swept locations. Of these there is a great range in form and color of foliage and habit of growth. *Cupressus obtusa* forms a small, loose, pyramidal tree, from fifteen to twenty feet high, with rich, glossy green foliage. The variety *nana* has curiously crested foliage and a dense habit, varying in color from deepest green to golden tinges in its sub-varieties. *C. o. lycopodioides*, with rich, metallic-green foliage resembling club-moss; *C. o. filicoides*, with beautiful, fern-like foliage, and *C. o. pendula* are other distinct forms. *C. pisifera* is also productive of many varieties, varying in form from symmetrical, well branched pyramidal trees to dwarf, globular shrubs, and in color from greens through silver and gold tones. The other best varieties include *C. p. aurea*; *C. p. gracilis*; *C. p. plumosa*; *C. p. p. aurea*; *C. p. squarrosa*, etc.

Our native White Cedar is a true Cypress (*Cupressus thyoides*) and is beginning to be recognized as of some ornamental value. It will thrive on much dryer soils than its usual habitat would lead one to suppose.

The Chinese Cypress (*Cryptomeria Japonica*) is not sufficiently hardy to admit of general cultivation. Where it succeeds, however, it makes a narrowly conical tree, with reddish bark and drooping branchlets covered with short, pea-green foliage.

Of the true Cedars, the Mount Atlas Cedar (*Cedrus Atlantica*) and its silvery variety, *glauca*, are occasionally seen in sheltered locations but can hardly be recommended for general purposes.

The Yew family comprises a number of ornamental forms and the demarkation between tender and hardy sorts varies according to the nature of the soils and exposures in question.

None of the Cephalotaxi can be relied upon, though *Cephalotaxus Japonica fastigiata* is the most rugged. The English Yew (*Taxus baccata*) in shaded, sheltered locations forms a broad,

shrub-like tree, with dark foliage, and the golden leaved form known as *T. b.* var. *Washingtonii* is quite satisfactorily hardy; the pyramidal Irish Yew, *T. b. Hibernica*, when used in shady locations frequently proves hardy, and additional forms that prove satisfactory are *adpressa*, *ericoides*, and *glauca*. The American Ground Yew or Ground Hemlock forms dense carpets in shady woods and in open, sunny situations becomes more bush-like in effect. The foliage is of a rich, pleasing green. From Japan the *T. cuspidata* is received in two forms, one with dense, broad habit and short, stiff foliage; the other of more loose and open habit and longer, softer foliage. Both are very hardy.

Japan has provided us with another beautiful evergreen lawn tree, the Umbrella Pine (*Sciadopitys verticillata*) which is perfectly hardy, forming a narrow, pyramidal tree with darkest green foliage, arranged in curious whorls on the branches. Yew-like in its depth of color and foliage effect, yet distinct in affinity, this tree stands alone in its individuality and beauty. It has a variety with golden, variegated foliage, known as the Golden Leaved Umbrella Pine.

We have now considered those varieties of coniferous evergreens of known hardihood, noting their wide range in habit of growth and hue of foliage, and are able to conceive of the many and varied landscape effects for which they may be used, more especially in overcoming the usual monotony of the winter landscape.

We are now prepared to look into the question of the possibility of variety in broad leaved evergreens, and here Rhododendrons with their magnificent floral effects so varied in color in the Hybrid varieties, ranging from purest white to deepest crimson and shades of purple, with rare instances of yellow shades, naturally assume the highest importance. By a critical selection of varieties perfect hardihood can be assured, though their demands of cool, shady situations with abundant moisture must not be lost sight of, but while *Rhododendron Catawbiense* has been given full credit for its value, some other species have been neglected and are seldom planted, though *R. maximum*, a rare native, but abundant in some sections, is becoming an important plant of late for producing immediate effects by the transplanting of well developed plants from their native thickets. *R. punctatum* has a

Leucothoë Catesbæi.

smaller foliage than either *R. Catawbiense* or *R. maximum* but is useful in combination with both, while *R. Wilsonianum*, *R. hirsutum* and *R. ferrugineum* form still dwarfer growths and are useful for edging groups or in rockery plantings. Our native Mountain Laurel (*Kalmia latifolia*) has been slow in forcing itself into public and extended use, but newer methods of supply have brought about a revolution in its use and we can now enjoy its unique and unsurpassed flowers at less expense than in former years. The other native species, *K. glauca* and *K. angustifolia*, are useful, though they never will come into as general use as the ordinary mountain laurel. Of Azaleas as generally known under that name, we have but one hardy evergreen representative, *A. amœna*, with its small, glossy-green foliage and showy crimson or purple flowers.

In Andromedas or the Lily of the Valley trees we have no finer species than *A. floribunda*, which gives an effect of flower throughout the winter, though actually this effect is produced by the buds which form the fall previous and remain ready to open with the first warm weather of spring. *A. Japonica* is a second species of high merit and capable of rich effects with proper use. *A. calyculata* and *A. eatifolia* are other evergreen species of value.

There is a class of broad leaved evergreens that are noteworthy more for their foliage than for their flowers, and under this head we must include the Box plants which vary in the stature of the varieties from the Dwarf Box, used in old-fashioned gardens for edgings, to small tree effects produced in larger growing varieties, of which specimens are to be found in this vicinity some ten feet high. *Laurus schipkœnsis* is hardy and can be used to a limited extent in the same manner as Laurel is used in English gardens. Unfortunately, however, cost will prevent its extended use. The Holly-leaved Barberry (*Berberis ilicifolia*) and *Mahonia aquifolia* or Ash-berry are types of a family of evergreens varying in hardihood, those mentioned, however, being perfectly hardy forms. The Fire-thorn (*Cratœgus pyracantha*) is a useful evergreen either as a hedge plant or for groups with other shrubs. While frequent complaint is heard that the English Holly lacks hardihood, we must not lose sight of the fact that we have here our native American Holly, a close peer of even more rapid growth

and with fine broad foliage, brilliantly lightened up and enlivened in effect by its bright scarlet winter berries. Another native evergreen shrub that is much neglected is our Ink Berry, *Ilex glabra*, a plant with oval, shining green foliage and black berries, which forms a dense shrub attaining a mature height of four feet. Closely allied to this is a Japanese species, *I. crenata*, recently introduced and much sought for already. We also obtain a semi-evergreen effect from the California Privet.

Among vines we have the semi-evergreen effect of the Hall's Honeysuckle and *Akebia quinata;* the true evergreen effect of the English Ivy, which in shaded locations is occasionally seen to perfection even in this vicinity.

Broad-leaved evergreens of low growth include the Scotch Heathers, perfectly hardy subjects forming a mat on the surface of the ground and giving an abundance of bloom in shades of white, red, and purple, and some of the English Heaths such as *Erica tetralix*, *E. carnea* and its varieties, are hardy, while closely allied evergreens include *Cassiope hypnoides*, *Vaccinium Vitis-Idœa*, *Daphne Cneorum*, *Empetrum nigrum*, and *Ledum latifolium*, and European plant lovers are eager seekers for our Mayflower (*Epigœa repens*), Checkerberry (*Gaultheria procumbens*), Partridge Berry (*Mitchella repens*), and *Linnœa borealis*. The *Leiophyllum buxifolium* or Sand Myrtle is a useful plant for rockwork, and for such uses we may add the following: The Hardy Candytuft (*Iberis corifolia*, *I. sempervirens* and other varieties), the Creeping Thyme (*Thymus vulgaris*), some of the Speedwells (*Veronica incana*, etc.), *Heuchera sanguinea* with its broad, deeply indented, light colored foliage and bright crimson flowers, *Galax aphylla*, now so frequently used by the florist, in its bright glossy green or bronze red, round, toothed foliage; the Achilleas in their varied foliage and flowers as shown in *A. Ægyptiaca* with silvery foliage and lemon yellow flowers and *A. tomentosum* with matted, moss-like, soft green foliage, and golden yellow flowers; *Alyssum serpyllifolium* with silvery foliage and *A. saxatile* with broader foliage and both with golden flowers in spring. The Armerias or Thrifts give odd, pin-cushion-like effects, and vary in flower from white to crimson, and the Helianthemums or Rock Roses are a most charming class, with broadly spreading, thickly

matted foliage and flowers varying from white through yellows to crimsons. The Saxifrages are also distinct in their broad, rounded foliage, of a thick, leathery texture, taking on shades of crimson and purple, in addition to the summer greens, and *Sedum Sieboldii* is evergreen in its effect and charmingly graceful in its habit, while the Houseleeks or Sempervivums with their rosettes of spiny, pointed leaves, thickly clustered among the crevices of the rocks are quite unique and form a stepping stone toward the use of hardy Cacti of which we have perhaps a dozen species of more or less hardihood, among which *Opuntia vulgaris*, *O. Missouriensis* and *O. Rafinesquiana* are well known and to be depended upon. Of trailing and climbing plants that have not been noted, we can add the Bearberry (*Arctostaphylos Uva-ursi*), the rare and somewhat difficult *Lithospermum prostratum* with its rich blue flowers, the Periwinkle (*Vinca minor*) with its rich glossy green foliage and blue flowers, and even the Cranberry is a useful plant, particularly in moist spots.

There is still another class of plants of which no mention has been made—the hardy Bamboos, of which a list of some dozen varieties could be mentioned which are perfectly hardy, and of which the best and most distinct perhaps are *Bambusa erecta*, *B. Veitchii*, *Arundinaria Metake* and *A. nana*. In these there exists a confusion of names at present which requires close acquaintance to remedy. Their hardihood has only been proved of late, but a colony can be seen at the Arnold Arboretum which will show their variety at least.

This list is not a complete one, but I believe will serve to show that we have a great range of evergreen material to work with, and that there are possibilities for extending the interest in our gardens far beyond the flowering period of plants, and rendering such gardens attractive at least up to that period when snow deeply covers the ground.

The lecture was illustrated by stereopticon pictures of the trees described, some of which are reproduced here.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, January 19, 1901.

A meeting for Lecture and Discussion was holden today at eleven o'clock, the President, O. B. HADWEN, in the chair.

The following lecture was delivered:

THE TREES OF OUR NEIGHBORHOOD.

By Miss EMMA G. CUMMINGS, Brookline.

As I have long been interested in the study of trees, I determined a few years ago to make a more intimate acquaintance with them, especially with the trees growing in this vicinity.

With an enthusiastic companion many pleasant hours have been passed walking along the roads or wandering through the woodlands, and these walks have been filled with interesting and amusing incidents.

Once we lost our way in the woods back of the Brookline Country Club, and wandered about for hours, when, hearing the sound of music, we turned in that direction and before long found ourselves in sight of the open ground of the Country Club. But to our dismay the place was guarded by policemen and we dared not cross. At length a mounted officer approached us and we asked permission to cross the land, which at first he peremptorily refused. We explained our situation, and after many questions on his part, to satisfy himself that we were not trying to gain an unlawful entrance to the scene of the races, he offered to escort us across the grounds to the Clyde Street entrance, and this, just as a crowd of people were arriving for one of the May Meetings. By this means, however, we saw a Cut-Leaved Beech, the first that we had noticed in Brookline. We have seen several others since then, but none are so large and handsome as the famous Cut-Leaved or Fern-Leaved Beech in front of the Redwood Library at Newport, R. I. It is not a native tree, but a variety of the European Beech. Trees known as *cut-leaved* such as beeches and birches, also weeping varieties, and those with purple or copper-colored leaves are all propagated from individual trees, each known

as a *sport*. They are reproduced by cuttings, as the seedlings generally revert to the original form.

We have watched the trees in summer as well as in winter, when the study of the buds, and of their method of growth and branching is a fascinating one. Olive Thorne Miller says, "When the winds and frosts of Autumn have stripped the trees; and the leaves, which have formed the tender beauty of Spring and the glory of Summer lie prone in the dust, think not the beauty of the tree is departed. Then first it shows its undisguised *self*— its individuality."

In fact all seasons have a special interest. In winter alone, the leaf and flower buds peculiar to each species can be studied to advantage. With the spring comes the unfolding of these buds and flowers, the latter in some cases delayed into summer, when the trees in full foliage, and many already in fruit, are seen at their best. In autumn the leaves change color and fade, but in doing so the maples, oaks, and others take on a line of coloring each peculiar to itself, thus giving from season to season, and from summer to winter, a renewed interest in their appearance.

Our attention was first given to the native trees—that is, native or indigenous to the United States, and of these we found about one hundred. In consequence of our severe climate some of these trees are small, but in more favored localities they grow to a good size. Such are the Silver Bell and Fringe trees, hardly more than shrubs on our lawns, yet both are planted for their abundant showy white flowers. Such also are the Speckled Alder, and the small shrubby Magnolia, or Sweet Bay (*Magnolia glauca*) that grows in the swampy lands of Magnolia and Gloucester, but which in its southern home grows to be an evergreen tree of fifty to seventy-five feet in height. There the leaves remain on the branches with but little change of color, until the appearance of the new leaves in the spring, while in the northern states the leaves fall in early winter.

About forty-five kinds of trees are native in Brookline, the suburb or vicinity above alluded to. Some are growing in profusion, while others are represented by only a few specimens. To this number should be added a few not naturally wild in this region, but which have established themselves, and appear like

natives. They are Willows, Buckthorn, Locusts, Apples, and Cherries. They have not, however, strayed far into the woods, but are generally found near houses.

The large willow trees that we all remember to have seen growing by the side of streams or on low lands, are of European origin, probably brought over by the earliest settlers, and that includes both the upright and weeping willows. Of our native New England willows, but one assumes a tree form, the Black willow, and that is not common near Boston.

Locusts are not seen at their best here. They have suffered greatly from the ravages of the borer; otherwise they would be exceedingly valuable as timber trees. Of all our North American trees it is the one most commonly planted in central and northern Europe. I have scarcely ever seen anything so beautiful as the streets of a city in southern Spain in the month of April, when the locust and orange trees were in full bloom. Not until then did I appreciate the beauty of the locust tree.

We ought to feel satisfied with the variety of trees growing naturally in Brookline, when we learn that there are only between eighty and ninety species indigenous to New England, and a large proportion of these that are native in other parts of New England are planted in Brookline, including some of the Maples, Oaks, Mountain Ash, Butternut and Black Walnut. According to Professor Sargent's latest estimate there are in the Atlantic region three hundred and forty-three species, and in the Pacific region, including the Rocky Mountains, one hundred and sixty, besides seven common to both regions. This makes the total number in North America north of the Mexican border, five hundred and ten. New species are constantly turning up, especially of Hawthorns, so that it is possible that the number in the Atlantic regions will have to be still further increased.

Of the trees native to the Southern States we have growing in our midst, Magnolias, Locusts, Judas or Red-Bud, Virgilia, Liquid-ambar, Red Mulberry, and the Bald Cypress (*Taxodium distichum*). The latter, the most interesting and rarest of this group, is represented by a beautiful specimen near Gardner Road, on the Blake estate. It is easily identified by the passer-by, as it stands alone on open ground, and is a tall, symmetrical tree, conical in

shape. It belongs to the coniferous or evergreen group of trees, yet contrary to their custom, sheds its leaves in winter, as its name, *Bald*, or Deciduous Cypress indicates. At the South it covers vast areas of low land, and travelers who have seen it speak of its impressive height, with its branches covered with Tillandsia, the so-called Southern moss.

From the Western States we have the Kentucky Coffee tree, the American Crabapple (*Pyrus coronaria*), interesting for its beautiful fragrant flowers, and the fact that it comes into blossom ten or twelve days after all the other apples have shed their petals, yet it is less frequently planted than the Japanese varieties, the Ash-leaved maple, Osage-orange, which is used in the West and South quite extensively for hedges, and some of the Oaks. While from the North there are the Mountain Ash, Balm of Gilead, Balsam Fir, White Spruce, and Arbor Vitæ (*Thuya occidentalis*).* The Rocky Mountains furnish two trees, the Colorado Blue Spruce, and the Douglas Spruce or Fir, commercially one of the most valuable trees of the world. On the Pacific coast it grows to a height of two hundred feet and over; lumbermen say three hundred to three hundred and fifty feet. With the exception of the big trees (the Sequoias) of California, no tree equals it in massiveness of trunk or in productiveness of timber, and it is one of the most widely distributed trees of North America. I know of no large specimen in this neighborhood.

Beside these American trees we have drawn largely upon far distant parts of the world to beautify our lawns and roadways, and we can count as many, or more kinds of foreign trees growing in our midst as there are native ones. They come from Japan, China, Corea, the Himalaya Mountains, Persia, the Caucasus, Siberia, Northern Europe, and Southern Europe, bringing up the total number of species that we have seen in and about Brookline

*The Arbor Vitæ, used so much in New England for hedges, where it grows wild in wet soil, forms almost impenetrable thickets and is often called White Cedar. The local name of a tree is often very misleading. For instance, it is quite common to call any hard wood by the name of *iron* wood, and in the United States there are twelve different trees called ironwood; several kinds of trees are called cedars; six different pines are called Yellow Pine; and there are eight Balsams, and sixteen Junipers, each referring to different species, and often to different genera.

to two hundred and sixteen. Many of the exotics have been with us so long that there is no question about their adaptability to our climate, while others have not yet been proved to be thoroughly hardy.

Until about fifty years ago, the larger part of Brookline was covered with a growth of forest trees, and in some sections they still remain. Such is an area of about five hundred acres bounded by Heath, Hammond, Newton, and Clyde streets, where are still to be seen the finest specimens of Hemlocks and White Pines, and the only Black Ashes I know of in the town are here. A portion of this land bordering on Newton and Hammond streets has recently been reserved by the Park Commissioners. Would that they also had taken about fifty acres of land which is situated between Boylston street and the Boston & Albany railroad tracks, near the pumping station of the Boston Water Works at Chestnut Hill Reservoir. It is bounded on one side by Reservoir Lane, one of the most picturesque and rural roads still left to us and is accessible to everybody who wishes to visit it, being about five miles from the State House. It has proved to be one of our favorite haunts, for here grow thirty-five different species of native trees. Among them fine large old Chestnut trees, Black and Yellow Birches, five different Oaks, and four different Hickories, — the Shagbark (erroneously called Walnut), Mockernut, Pignut, and Bitternut. The Bitternut is the most beautiful and graceful of the four trees, yet its nuts are so bitter that even squirrels, except in dire extremity, will not eat them. The Pignut was formerly regarded as nearly worthless, but now a variety has been found with a thinner shell and without the bitter taste, which it is hoped under cultivation will produce nuts commercially as valuable as those of the Shagbark.

The region around Hammond's Pond, near the Newton line, has a special interest as being the location where White Cedar (*Cupressus thyoides*), Black Spruce, Poison Dogwood, and the American Larch are growing, for they are among the rarer trees of this vicinity.

The portion of Brookline known as Longwood (*long wood*) derived its name from a narrow strip of woodland formerly extending from Aspinwall Avenue to Commonwealth Avenue, near

St. Mary's street. This name was adopted about 1821 when the territory began to be cut up for summer residences. Until then, there were only two or three houses in this district; one was owned by Judge Sewall, for whom the present Sewall Avenue was named. Many of the oaks of this *long wood* are still standing, and here and there other fine trees.

The Boston and Brookline Parkway is an unusually picturesque drive for one so near to city limits. The natural features of the place have been made the most of, while the banks of what was Muddy River have been improved by judicious planting of native and foreign shrubs and trees. It affords an excellent place to study and compare the different maples, oaks, thorns, and so on, and it is to be hoped that in the near future enough public interest will be taken in this subject to induce the Park Commissioners to place labels on the trees — at least on the oldest and finest of them — especially the oaks, a hop hornbeam, and some black birches near the Longwood Avenue bridge, on the Boston side of the Parkway.

I once asked in the Parkway the assistance of a police officer in picking a specimen of a peculiar linden tree (*Tilia platyphyllos* var. *vitifolia*). Now it happened, as I afterwards learned, that the man was very fond of trees and knew a good deal about them. But this particular tree he did not know, and when I called it a Linden, he said, "If that is a Linden, it is different from any that I have ever seen," and to find out if I knew of what I was talking, he tested my knowledge on some of the surrounding oaks and maples. Finding that I was not altogether ignorant, he told me of his great love for trees, and how very few people with whom he came in contact knew one tree from another. After a little further talk about the neighboring trees, I left him, glad to have seen one who made it his pleasure to observe and know the trees while on his round of duty.

We in Brookline are fortunate in having within our town limits a considerable extent of high land, more or less rocky, and low, swampy ground, all favorable to the growth of a great variety of species. Large estates of wealthy residents contain many planted trees, and on one in particular, the estate of Professor Charles S. Sargent are to be found a great variety of exotics, which are not seen elsewhere.

Some years ago foreign trees were extensively planted along our streets and avenues, almost to the exclusion of our native species. Many objections were raised, and now the tendency in planting seems to be in favor of native trees. We should all regret, I am sure, if our wayside trees were exclusively native, when we consider that it is to the European maples, beeches, elms, ashes, oaks, and hawthorns that we owe so much that is beautiful in the autumn. If you have never noticed, do so this year, that when many trees have lost their leaves and stand with bare branches outlined against the sky, there are others with foliage still bright and green, and they are pretty sure to be the foreigners just alluded to. These, all without an exception, hold their foliage longer than our native trees, and make bright, attractive spots in the landscape, at a season when our country would look dreary without them. It is surprising for how long a time the green clings to them. It is until late November and even into December, when the beeches alone are left, and on their branches the brown leaves remain, as they do on some of our oaks, all winter, or until the coming of the new leaves in the spring.

Since 1899 our town has appropriated $2000 a year for planting trees, and for the care of them along the highways. In 1895 a Town Nursery was established which for a time furnished all the trees needed. Over 6,000 trees have been set out, and many have been cut down, sometimes to prevent over-crowding, sometimes for the cutting through of new streets, or widening of others. We regret the loss of a fine group of American Linden trees, that were cut down to make room for the electric cars on Boylston street; also the loss of two rare trees, a striped maple, and a hackberry (*Celtis occidentalis*), which were cut down on account of the grading of the same Boulevard.

If some of our trees are undersize, certainly some are remarkably large, and for a stroll in the woods it is always well to include, beside a note-book, a measuring tape in one's pocket, for without actual measurements it is not safe to determine the size of a tree.

In the woods off Clyde street one day I came upon some very large trees, which at first, from their general appearance, I took

to be oaks. To my amazement, a closer view showed them to be red maples, one of them measuring in circumference at five feet from the ground eleven feet and two inches, or a diameter of three feet and six inches. Not many red maples in this vicinity are more than a foot and a half in diameter, the comparison of which shows the unusual size of the Clyde street maple.

On the south side of Corey Hill is a very remarkable group of sassafras trees. In this State sassafras is usually a shrub or small tree, but here are half a dozen trees, the smallest of which is six feet in circumference, and the largest measures nine feet and seven inches, and has a diameter of three feet.

In Longwood, on a portion of the old wooded ridge, now the Sears estate, there are three trees with low, wide-spreading branches, of which, when first seen in the winter, we had to confess ignorance, but later recognized them to be the white mulberry (*Morus alba*), one with the astonishingly large girth of seven feet and six inches. This tree is a native of China, and is cultivated in Japan, India, and the countries along the Mediterranean for its leaves, which furnish the best food for the silkworm. Some sixty years ago the hope of establishing the silk industry in the United States led to to the greatest horticultural speculation the country has ever known. Nurserymen and farmers covered their lands with mulberry trees, planting a variety of the white mulberry, but the climate in the north proved to be too severe for this variety, and in the course of a few years most of the trees died, thus ruining thousands of people. I have tried to learn something of the history of this Longwood group of mulberry trees, but so far have been unsuccessful. It would be interesting to know whether they were planted about the time of this mulberry enterprise, which was known as the "Morus Multicaulis Speculation."

Though we have a good many large Chestnut trees within our town limits, probably the largest one is found on the Boston side of the line. Standing alone in a field, it has had an exceptional chance to spread in every direction, and although the branches are now decaying, it does not affect the enormous size of its trunk which is sixteen feet nine inches in circumference, and five feet four inches in diameter.

On the Boston side, also, is a magnificent specimen of a Buttonwood or Sycamore tree, measuring a little less than fourteen feet around the close bark of its trunk, and very nearly holding this size to the first branch, a height of twenty feet. A fungus has attacked buttonwood trees which causes them to lose their leaves in the early summer, and then they have to put forth a second crop of leaves, which great expenditure of energy has crippled, or left them in a far from good condition. It would seem as if this tree had escaped some of the misfortunes of its kind, and thus had opportunity to increase in beauty from year to year, and its position has been somewhat sheltered by the numerous elm trees in its immediate vicinity.

These buttonwoods which are among the largest deciduous trees in America, grow to a very large size in the Mississippi Valley, where it would not be unusual to see them with a trunk three times as large as the one I have described. A lady living in its vicinity tells me that she remembers the tree fifty years ago, and that it seemed to her then, a large tree. It is often called Sycamore, and in England it is called the Occidental Plane, to distinguish it from the Asiatic tree which is called the Oriental Plane. The name Sycamore as used in England is generally applied to the Sycamore maple, while in the East a sycamore is a fig tree.

Around the shores of Jamaica Pond in Jamaica Plain, can be seen some very interesting trees, many on the land bought by the City of Boston for a Park Reservation from the estate of the late Francis Parkman and set out by that lover of trees.

The rarest and most remarkable tree is a Hybrid Walnut, on the grounds of Mr. Eben Bacon. It is a cross between our native butternut and the English walnut (*Juglans cinerea* × *regia*). The tree is supposed to have been planted between fifty and sixty years ago. "Garden and Forest" states "there are only two others, so far as is known, in the neighborhood of Boston, one in Cambridge on the Episcopal College grounds, and one in Milton near Houghton's Pond. The three trees resemble each other, and had evidently the same origin, though there is no record to tell their history, and nothing but the apparent intermediate character between two well known species, and their comparative barrenness to justify the belief that they are hybrids."

The most remarkable, as regards size, is an Amelanchier, formerly on the Morse estate, and commonly known as the shad bush. It is usually a bush or shrub, but here it has grown to the height of thirty or forty feet with perhaps a distance of fifteen feet to the first branching. This tree would have been cut down in the laying out of the pathway but for the remonstrance of one who knew and appreciated its value.

The next in interest as regards size is a Striped maple (*Acer Pennsylvanicum*), or Moose Wood. In the Maine woods the tender young branches are a favorite food of the moose; hence the origin of its popular name.

There are Magnolias—the Sweet Bay, and the Large-leaved magnolia (*Magnolia macrophylla*). Its leaves are often from twenty to thirty inches long, and the creamy white flowers from ten to eleven inches across—flowers and leaves being more conspicuous than those produced by any other tree of the North American forests. It was introduced into European gardens a hundred years ago. Another species of magnolia (*M. Acuminata*) popularly called the cucumber tree, because its fruit resembles a cucumber, has been even more extensively cultivated in Europe and in our own northern states. We have counted nine species of magnolias cultivated in our limited area, five oriental and four American species.

Others of special interest are a good sized Silver Bell tree (*Mohrodendron Carolinum*), and a Crab Apple known as Parkman's Crab. This very tree was sent by Mr. F. Gordon Dexter from Japan about 1863, and found a home in Mr. Parkman's garden. It came without a name, and was christened Parkmani,—Pyrus is the botanical name of the genus to which apples belong, so it was called "Pyrus Parkmani." The sames species was afterwards sent to this country by Dr. G. R. Hall, an American physician long resident in Japan, and consequently it then received another name, *Halleana*. It now appears in trade catalogues under both names. It is very similar to the beautiful flowering crab known as *floribunda* from the abundance of its flowers. These Japanese crabs are particularly attractive just before the deep crimson buds expand and show the lighter colors of the interior of the flowers. A little further around the pond is a Tupelo

tree, a species once numerous in the lowlands of this neighborhood, with its shining green foliage in the summer, changing to brilliant red in the autumn.

Unless it be an unfavorable year some of our trees are in bloom from March to December. White or Silver maples take the lead, and they may be in bloom as early as the first week in March. They are quickly followed through the month by poplars, willows, American elms, and red maples.

In April come the yellow-green catkins of the birches, the English elms, ashes, some of the conifers and the Japanese magnolias, the magnolias that bloom before the leaves are out; also the European maples, principally the Norway, with its showy clusters of light yellowish green flowers, followed by the Sycamore maple, with its hanging racemes. These are the two European maples so commonly planted.

May brings the greatest wealth of blossoms; chief among them fruit trees—pear, cherry, and the most beautiful of all, the pink and white blossoms of the apple. Closely vying with them are hawthorns and horse chestnuts, which we might think as beautiful as the apples if we saw them in the same quantity. Then cornels, viburnums, and a host of others, many not as showy, such as the beeches, hickories, walnuts, and oaks.

In June the tulip tree blooms, the wood of which is known as white wood, and is so extensively used in all parts of the country, and the Virgilia (*Cladrastis lutea*) with its conspicuous hanging white flowers, of which a fine specimen is growing in the Public Library yard. It is one of the rarer North American forest trees, but one of the most beautiful flowering, although the flowers come in profusion only every other year. Also the Golden Laburnum and one of the Catalpas (*Catalpa Catalpa*) which somewhat resembles the horse chestnut, with its upright panicles of whitish flowers; and by the last of the month the air is filled with fragrance from the blossoms of the European Lindens. These are just gone, when our American Lindens follow in July, and soon the tops of the chestnut trees are all aglow with blossoms. With one exception, the chestnuts are the last of our native trees to bloom. Being one of the last to bloom, it is nevertheless one of the first to ripen its fruit and I have heard it called the "smartest tree" for this reason.

Now comes another interest in foreign trees; for as ours are fading, they fill the gap until autumn. There is a tree called *Koelreuteria paniculata*, having no English name, which in midsummer shows its great panicles of yellow flowers, followed in due season by light colored bladdery pods, which are conspicuous on the tree even after the leaves have fallen. There is a good specimen here in Boston in the Public Garden.

Two trees from China furnish showy blossoms in August, a month when everyone who can, leaves the city, and thereby misses the sight of these attractive trees. They are Sophora (*Sophora Japonica*), and a Sumac (*Rhus Osbeckii*). Besides two or three Sophora trees in Brookline, there is a very noticeable one on the Public Garden near the Ether Monument. The sumac is a shapely small tree growing on the Boston side of the Parkway, and can easily be seen from the electric cars, as one passes the Parkway on Huntington avenue.

In September, we would naturally say there is no tree that will bloom in this month, but yes—when the late September and October days come, there is the cheerful little star of the Witch Hazel, shining like spots of gold in the midst of decaying leaves and brown branches. Through November and even into December, when the trees have lost their leaves, these pretty little flowers are seen at their best. It is perhaps in January and February that the bright yellow and red twigs of willows and cornels, as well as the red berries of the mountain ash and hawthorns are most appréciated. These, with the conifers, offer the most striking attractions for the winter months, or until March returns, and the silver maples again greet our eyes.

Although these references have been mostly to Brookline trees, the same things can be said of the trees elsewhere. Right here in the midst of this city of Boston, the Common and Public Garden offer excellent places to study trees. There is a good variety, including some fifty-three or more species in the Public Garden alone, and many of them are labelled. There are native trees as well as foreign that blossom through successive months.

The surrounding towns offer still greater advantages. After studying cultivated trees, it ought to stimulate an interest to find them growing in wild places, and to know them is to love them.

It is hoped that this sketch of trees will lead others to find what a world of beauty and enjoyment lies around us.

Who that has seen in the Spring the scarlet flowers and fruit of the red maple, the delicate drooping clusters of the sugar maple, the snowy whiteness of the fruit trees, set off by the delicacy and richness of the tints of young leaves of the birches, beeches, oaks, and others—who, I ask, that has seen them, can willingly spend these days in a city? It is like fairyland, if we but think so, made still more delusive by the singing of returning birds, and the occasional glimpse of some bit of their brilliant plumage as they flit from limb to limb and tree to tree but partially concealed amid the half open foliage. Who that has seen it and felt the enchantment on a bright sunshiny day, can resist it? We give ourselves up to the spell, for in our capricious climate these perfect spring days are rare, and we say to ourselves the years are too few.

Discussion.

J. W. Manning said that he had probably the largest tree of *Rhus Osbeckii* in America. The trunk is a foot in diameter, and the top spreads twenty-five feet. It blooms at the same time with the Sophora, and is very beautiful. He spoke of an elm planted on the day of the battle of Lexington and Concord on the Joshua Gowing estate in Wilmington; it is now seven feet or more in diameter, and spreads one hundred and thirty-five feet. He also mentioned a famous hemlock, eighty feet high and the same in spread, with a circumference of eighteen feet, on the Jacquith estate near the Burlington road. It was known as "the great hemlock," seventy-one years ago.

Hon. Aaron Low said that when he was in the army in Louisiana, he camped in a magnolia grove. The trees were from one hundred to one-hundred and fifty feet high and covered with blossoms. He spoke also of the bay trees, completely covered with pink blossoms before the foliage came out.

Benjamin P. Ware had been extremely interested in the lecture. Few people, he said, notice the great variety of trees about them. They lose much by not observing them. He spoke of the magnolias growing in a swamp in Manchester, the most northern location of the magnolia.

The President said he had been exceedingly interested in the lecture and was further interested to see a lady who had such a love for trees and such a knowledge of them. He has planted a good many trees, some of which are now of stately growth. Every year brings some new tree to try. A locust tree in Worcester has a circumference of twelve feet, and bark four inches thick. It was planted years ago by Mr. Green, the grandfather of Hon. Andrew H. Green.

The Silver Bell sometimes grows to fifteen or twenty feet in height, and is a magnificent sight in flower. The White Fringe is usually a shrub, but with cultivation can be grown to a large tree.

The speaker has fifteen kinds of magnolias; among them two large-leaved, *M. tripetala* and *M. macrophylla*, if protected the first few years, will flourish well. The latter is not so hardy as the former; it grows so late as to be injured by the winter unless protected. Mr. Hunnewell has a fine specimen. It is perhaps the best of all the magnolias. The speaker has also *M. Soulangeana*, *M. conspicua*, and a new one called Alexandrina, which will probably prove one of the best. Even if magnolias fail to bloom the leaves make them worth cultivation.

The Black Walnut is not as much cultivated as it deserves to be. Its leaves are very graceful and beautiful, and it bears an abundance of fruit. There is a new variety from Japan. There are in Worcester black walnut trees ten feet in circumference, and forty feet high. The speaker has in his house a cabinet made from a black walnut tree which he planted.

In Leicester there were formerly a large number of mulberry trees in a place called Mulberry grove.

Jacob W. Manning spoke of a group of Pawpaw trees twenty feet high, growing in a garden in Lowell. Pawpaws are not always hardy but these seem to grow well. There is a White Mulberry tree in Chelmsford four feet in diameter and sixty feet high, with a spread of branches of more than sixty feet.

Robert Manning said he has two Pawpaw trees. They are quite hardy and he had no difficulty in transplanting them, but though they had blossomed, they had never set any fruit.

He wondered how many people had ever seen the young cones of the Larch trees when they first come out in the spring. The

pistillate and staminate flowers of the larch are very charming when closely examined.

The President said that he has three varieties of larch, one European and two Japanese. The cones are exceedingly beautiful and also the foliage. The foliage of *Larix Kœmpferi* is unlike that of any other.

J. W. Manning spoke of a Basswood on the Beebe estate in Wakefield, seventeen feet in circumference and eighty feet high.

Thomas Harrison wished to call the attention of the lecturer to a Linden in Plymouth, which he thought the finest specimen in this vicinity.

A vote of thanks was given Miss Cummings for her very interesting and instructive lecture.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, January 26, 1901.

A Meeting for Lecture and Discussion was holden today at eleven o'clock, the President, O. B. HADWEN, in the chair.

The following lecture was delivered:

A VISIT TO KEW GARDENS AND HAMPTON COURT.

By BENJAMIN P. WARE, Marblehead.

Among the many interesting subjects suggested by a journey through Germany, France, England, and Ireland, I think no one more appropriate for this Society, than my visit to Kew Garden and Hampton Court.

Kew Garden was originally a private fruit and vegetable garden of seventeen acres, belonging to the Prince of Wales, the father of George III, who began to improve it as a botanical garden and pleasure ground in 1730.

It has received additions from time to time, so that at present it contains two hundred and seventy acres, continuing as private royal grounds until 1840, when it became public and was placed

under the control of Her Majesty's Office of Public Works, with an annual appropriation for its maintenance of £32,650 or $163,250. It is said to be the finest and most complete botanical collection and arboretum in the world. As for tree planting it can hardly be excelled. Kew Garden is seven miles from the centre of London and is accessible by steamboat, omnibus, or steam railroad.

The surface is undulating, with carriage drives around and through the grounds; with broad graveled walks in various directions, opening long vistas through well grown trees, some in rows but generally irregularly planted, with plenty of room for the full development of each tree. Every variety of tree, shrub, and herbaceous plant is plainly labeled, giving an admirable opportunity for study. It was intended that every variety that would grow in that climate should be represented in its very best possible condition, and as the winters in England are much milder than ours of New England many more varieties may be grown there than here.

It is very delightful when traveling in a strange land, to meet any one from your own country, even though an entire stranger at home. I found it even so, to see in this collection specimens of our beautiful white pine, hemlock, spruce, elm, mountain ash, white ash, and oaks; and among the herbaceous plants, our fall asters and golden-rod in variety, and many other familiar friends in perfection, and not excelled in beauty by those of any other country. As tree planting began there more than one hundred and fifty years ago, some of the trees are of large size. Among the more noticeable are a dozen or more Cedars of Lebanon of immense size, four or four and one-half feet in diameter. As they stand well apart, and were allowed to branch out near the ground, they grow in a form peculiar to that species; with their deep green, compact foliage and majestic forms they readily command the attention and respect given to this tree by early scripture writers, who frequently used the Cedars of Lebanon as symbols of strength, beauty, and grandeur. The fragrance and durability of its wood caused it to be sought and largely used in building King David's Palace, and Solomon's Temple. So abundant was it on Mount Lebanon, as to cover it with forest growth, affording material for

four score thousand hewers, in getting out timber for the temple. But alas! like our own forest, they have disappeared. In the sixth century Justinian found it difficult to procure cedar enough to cover a single church. Belon, in 1550, counted but twenty-eight trees; De la Roque, in 1588, found twenty; Pococke, in 1740, found but fifteen in that vicinity, the largest sixteen feet in diameter.

Near this group of cedars in the garden is an immense Scotch Pine, towering above all others, with a clean trunk, about one hundred feet to its first branches.

As an arboretum, Kew Garden compares favorably with our own Arnold Arboretum. The shrubs are in such great variety, so well grown and so plainly labeled that they afford a superior opportunity for study. Rhododendrons are especially fine here, as well as in other parts of England.

A wonderful collection of over six thousand flowering, hardy herbaceous plants, embracing more than one thousand varieties, may be seen here, all distinctly labeled; among them the original wild chrysanthemum brought from the hills of China one hundred and five years ago. It was the first introduction into Europe, making our magnificent chrysanthemum shows possible, as well as the one held last November at the Royal Aquarium in London, where its small yellow flower was shown in contrast with the latest triumph of the florist, a flower fifteen inches in diameter.

The most noticeable structure in the garden is the Chinese Pagoda, built in 1761. It is one hundred and sixty-one feet high, a magnificent structure, made especially conspicuous by the lay out of the landscape, so that it may be seen directly in front from several points, through long irregular lines of trees. Another very prominent object is the flag staff, a single spar of Douglass Pine brought from Colorado, supposed to have been two hundred and fifty years old. It is one hundred and sixty-three feet high, with twelve feet under ground, enclosed in solid brick work, to insure its security from wind and decay.

The palm house is probably unequaled in beauty and grandeur the world over. It is three hundred and sixty-two feet long with an ell on each side of fifty feet, one hundred feet wide, sixty-six

feet high, and filled with a great variety of palms and plants requiring the same conditions. Many have grown as high as the top of the building, and all are in perfect condition.

The horticultural museum is a large three story brick building, containing an herbarium, library, and many horticultural curiosities of interest. Between these two principal buildings is a very beautiful artificial pond, which makes a frontage for each building. The pond is alive with goldfish, swans, pelicans, ornamental ducks of the most beautiful varieties, and other water fowl. Around this pond are beds of flowers of the most brilliant and showy kinds. The beds are of artistic design and planting, with the intent of making this part of the garden the fairy scene that it is, beggaring description.

There is a wood museum, containing specimens of wood from all of the British Colonies, and other countries, with some curious freaks of growth; also seventeen or more greenhouses adapted to the needs of different families of plants supplying each with the necessary conditions for their best development. One of them is devoted to exotic water lilies, among which the *Victoria regia* is prominent.

Another is devoted to the cultivation of the citrus family of fruits, and another to the cactus in great variety. Among the many varieties of trees, some are of very curious habits of growth. Especially noticeable is the Chili Pine (Araucaria,) sometimes called the monkey puzzle, I suppose from the difficulty a monkey would have in climbing through it. A portion of the ground is set apart as a wild garden, with a perfect tangle of trees, shrubs, and herbaceous plants, in an apparent haphazard manner without order or design, and yet displaying much hidden artistic skill in the arrangement.

A conveniently designed temperance house for the benefit of the crowds of visitors during the season is centrally located amidst this beautiful garden scenery.

Miss Marianne North, an exquisite flower painter, devoted her life to travelling the world over, painting from nature flowers found in her extended travels, thus producing a true picture of each. Her collection contained eight hundred and thirty-three pictures, which she gave to the garden for the benefit of the public. They

are arranged in a brick building which she provided especially for them, adding very much to the beauty and interest of the garden. Where there are no flower beds the surface is a beautiful English lawn, such as we have often read of; so closely shorn, so green, so soft is it, that one is reminded of a velvet carpet. The signs are not "keep off the grass," but "please do not tread upon the edge of the grass," which is kept square and clean cut. When any portion of these lawns shows signs of exhaustion, the sod is carefully taken up in rolls, a heavy coat of old stable manure forked in, then the sod is replaced so carefully that no sign of its removal is noticed.

Kew Garden is so accessible, so beautiful, and so instructive, that it is not surprising that as many as ninety thousand people have visited it in a single day.

The Palace at Hampton Court is fifteen miles distant from London, and seven miles beyond Kew Garden, and is reached by the same lines of travel, continuing through Kew and Richmond by omnibus, or, if one prefers, by a coach and four-in-hand from Piccadilly Circus on Sunday mornings. The approach to the Palace is through Bushy Park of four hundred acres, by a broad avenue about one mile long. On each side of this avenue are fine rows of horse chestnut trees set fifty feet apart. These trees are two or three feet in diameter and about eighty feet high and cover a space, including the avenue, with their shade not less than eight hundred feet wide. Fancy them in May, when in full bloom; such a display of beauty and magnificence would alone repay one for going to London to see it. This park is occupied as a deer park and there are hundreds of deer as tame as sheep, feeding or basking on this immense lawn, singly or in groups. The Palace is an imposing structure of brick with stone trimmings, forming three quadrangles, surrounding an open court on three sides. Two of these were built by Cardinal Wolsey early in the fifteenth century, and when finished presented by him to Henry VIII. The beautiful Eastern front was built by Sir Christopher Wren in 1689 for William III, and is three hundred and thirty feet long. Much of English history during the reign of the Tudors was associated with Hampton Court; Edward VI was born there, and there his mother Queen Jane Seymour died. It was the prison of Charles I for many years, and Oliver Cromwell delighted to make it his

residence for much of his time. There are at the present time thirty-six rooms open to the public in the Palace; they are all finished in oak, the door and window frames richly carved. The walls of all are hung with fine paintings of various subjects. Full length portraits of kings, queens, and other famous persons are numerous among the works of the old masters. One room is wholly devoted to the pictures of Benjamin West; another contains the famous cartoons of Raphael. As the rooms are all connected by doors, they appear like a continuous picture gallery, containing in all eight hundred and ninety-seven pictures. Each room had its special use when occupied by the royal families in years of long ago, and still retains most of the furniture then used. The Queen's sleeping chamber contains a richly carved bedstead eight feet wide (the usual breadth of royal bedsteads throughout Europe) with a very high canopy at the head; the mattresses are covered with satin, and the other furniture upholstered with rich silk velvet.

The great hall built by Henry VIII, from its size, height, gorgeous stained glass windows, elaborately wrought roof, and walls hung with immense elegant tapestries, is decidedly the most magnificent hall of any in the Tudor Palaces. For three and a half centuries it was used for state functions, royal banquets, receptions of foreign ambassadors and theatrical performances. It is said that here King Henry often sat in state or danced with his favorites, Jane Seymour and Catharine Howard.

The Queen's Chapel is still in use for the people living in the vicinity. I attended the High English Church service the Sunday that I was there.

The garden of forty-four acres was laid out on each side of the Palace by William III. The right side, called the pond garden, is in the Dutch style, with elevated terraces, sunken paneled lawns, arcade walks formed by flowering shrubs, flower beds, and a goldfish pond. And here is the cold grapery, containing the famous Black Hamburg grape vine one hundred and thirty-two years old. The stem at the entrance of the glass house is one foot in diameter. There it sends out three or four branches three inches in diameter. These are trained so the whole roof of one hundred feet long and forty feet wide is completely covered;

and so carefully pruned and thinned are the bunches of grapes, that the crop of twelve hundred clusters hang at about equal distances of one foot apart from every part of the vine. As I saw them, fully ripe and well colored, they presented a sight that I never shall forget.

These grapes were subject to the late Queen's orders, who sent them to hospitals and to the sick, but she had graciously refrained from having a single bunch cut until I had seen them in their full glory. This enormous crop is maintained by an annual application of a heavy coat of old stable manure and ground bone, which is forked into a plot of ground, about as large as the grapery, just across a graveled roadway, the main roots passing under the road to this feeding plot.

The part of the garden on the other side of the Palace is differently arranged, and principally planted with larger shrubs and trees. Here is a maze, and unless you have your nerves well under control of a strong will power I would not advise any one to enter alone, for there is danger of a panic that might prove injurious.

Standing in front of the beautiful and imposing principal façade of the Palace one looks out upon a vast expanse of park scenery of eleven thousand acres. In the foreground is a fountain and in front is the Yew Park, planted with Yew trees two hundred years ago. These with their very thick, deep green foliage, the pistillate plants bearing an abundance of bright scarlet berries, present a very beautiful and unique feature in the landscape. They seldom grow higher than thirty feet but with a very large thick trunk. They live to a great age. There are several in England supposed to be from seven hundred to a thousand years old. There is one at Darley, Derbyshire that is fifty-five feet high, with a trunk nineteen feet and three inches in diameter; others, in Scotland and Ireland, are of about the same size, and are supposed to be as old as the Christian era. Virgil and Pliny both declared that the Yew tree was neither useful nor ornamental, but noxious and deadly poisonous in both foliage and fruit, while others have since said with equal authority of the foliage, that even its shade might be injurious, but the berries may be eaten with impunity. I ate of them without injury. The timber is comparatively indestructible and is of a beautiful brown color, and

takes a fine finish. It was formerly much sought for as being the best material for the long bow, used by the ancient English archers. It was regarded with great superstition by the heathen nations of old as being associated with death, but by Christians as emblematical of immortality, and, therefore, it has been much planted in cemeteries.

Opening out from the Yew Park, fan-like, are five broad graveled walks about fifty feet wide extending as far as the eye can reach. The middle one ends in a pond of the same width, well stocked with fish for the angler, and used as a skating rink in the winter. These walks are lined on each side with full grown English elms and linden trees about eighty feet high, with trunks from two to four feet in diameter. The branches of these trees are trimmed up uniformly about eight feet from the ground, showing an even uniform surface under the trees for the whole distance, a system of tree planting entirely different from that at Kew Garden, but beautiful in its oddity.

Far beyond, out of sight, is the Queen's farm, where formerly she kept her dairy, and bred Durham and other cattle, besides choice swine and sheep. She had relaxed her interest in those somewhat, but continued to breed cream-colored horses for her state team of eight to be used only on great State occasions, and three-quarter thoroughbred saddle horses, of which fifty or more are required for use at the Mews or royal stables at Buckingham Palace in the city of London.

On motion of Thomas Harrison a vote of thanks to Mr. Ware for his interesting and instructive lecture was passed.

At the close of the lecture twenty steriopticon views in Kew Gardens and vicinity were given by John K. M. L. Farquhar, which added much to the interest of the lecture.

BUSINESS MEETING.

SATURDAY, February 2, 1901.

An adjourned meeting of the Society was holden at eleven o'clock today, the President, O. B. HADWEN, in the chair.

The Annual Report of the Committee on School Gardens, School Herbariums, and Children's Herbariums was presented by Henry L. Clapp, Chairman, who gave a verbal abstract of the Report. The Report was accepted and referred to the Committee on Publication.

Joseph H. Woodford, Chairman of the Committee of Arrangements, reported the following vote, which had been unanimously adopted by that Committee:

At a meeting of the Committee of Arrangements held this day, February 2, 1901, it was voted to omit the exhibitions scheduled to be held on May 4th, May 18th, June 5th and 6th, and June 15th, owing to our having to vacate this building on May 1st. The Society's first exhibition in the New Hall will be the Rose and Strawberry Exhibition on June 20th and 21st.

J. H. WOODFORD,
Chairman Committee of Arrangements.

A copy of a letter from Charles S. Sargent of the Building Committee to the Chairman of the Committee of Arrangements, relating to the time when the new building of the Society would be ready for use, and a letter from William J. Stewart, Secretary of the Building Committee, to the Secretary of the Society, on the same subject, were read.

The report of the Committee of Arrangements was accepted, and the changes adopted by that Committee, as reported in the above vote, were confirmed.

Ex-President William C. Strong, to whom, as a sub-Committee of one, the matter of the meeting of the American Pomological Society was entrusted by the Executive Committee, to which it had been referred, stated that it was not deemed advisable to appoint delegates at the present time, but recommended that the Secretary notify the Pomological Society that delegates will be appointed.

Mr. Strong also, as Chairman of the Committee appointed on the 3d day of March, 1900, to confer with the Boston Co-operative Flower Growers' Association in regard to holding the next Carnation Exhibition of that Association in Horticultural Hall, reported that the Committee had conferred with the Flower Growers' Association, but that no conclusion had yet been reached.

On motion of Ex-President William H. Spooner, it was voted that the use of one of the Society's Halls be offered to the Co-operative Flower Growers' Association for their Carnation Exhibition the present year.

Mr. Spooner also moved that a Committee of three be appointed to procure a portrait of Ex-President Appleton. The motion was carried, and the Chair appointed as that Committee, Mr. Spooner, Benjamin M. Watson, and C. Minot Weld.

A letter was read from Charles E. Cotting offering to the Society, in behalf of the Trustees of the Paddock Building, the purchasers of the Horticultural Hall estate, the statues now on the building, to be removed by the Society prior to the termination of the existing lease; also offering to give and deliver, when the building is torn down, any box which may be found in the corner stone.

It was voted that the offer be accepted on the terms mentioned, and that the thanks of the Society be presented therefor; also that the Secretary inform Mr. Cotting that the Society would be glad to retain the two marble tablets in the staircase hall, commemorating the foundation of Mount Auburn Cemetery by the Society and the erection of the present building.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

HENRY ILLENBERGER, of Brookline.
DAVID WELCH, of Dorchester.
MISS JEMIMA R. WILDER, of Dorchester.
MISS GRACE S. WILDER, of Dorchester.
JAMES B. SHEA, of Jamaica Plain.
MRS. THACHER LORING, of Brookline.

Adjourned to Saturday, March 2.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, February 9, 1901.

A Meeting for Lecture and Discussion was holden today at eleven o'clock, the President, O. B. HADWEN, in the chair.

The following lecture was delivered:

GROWING AND EXHIBITING VEGETABLES AND FRUITS.

By HERBERT R. KINNEY, Worcester.

This subject is one of such large proportions that I shall not try to cover it in any systematic way, and shall not consider the raising of either vegetables or fruits otherwise than to speak of certain methods and conditions that are likely to give desired results.

Perhaps there never was a time since the existence of horticultural and agricultural societies, when there was greater need of giving this subject careful consideration than at present. In the early agricultural and horticultural exhibitions there were neither so many varieties shown nor so much money distributed, and the exhibitors were more what might be called amateurs than at the present time, and I, for one, am very sorry to see the amateur exhibitor being driven out by the professional. I will admit that I am one of the latter, and fear that I may be obliged to stay in that class, but my sympathies are certainly with the amateur.

It might be well to explain my idea of the amateur and professional exhibitor before going further. I shall consider the professional exhibitor one who exhibits for the dollars there are in it, and the amateur for the satisfaction of exhibiting exceptionally fine specimens and who would under no consideration enter an exhibit unless it showed considerable merit. The true amateur does not object in the least to being beaten, because when he is beaten he can see that there is still a chance for him to improve, and that is the height of his ambition. He is not considering the value of the prize, but rather the perfection of the fruit or vegetable he is growing. Not so with the professional; while he likes to show good specimens, he is ever keeping an eye on the cold cash, and he is willing to have his name on exhibits that he real-

izes are not a credit to him because he knows that he is likely to draw a prize on only common stock, sometimes, and the dollar is what he wants.

I should not wish to have a society discriminate for or against either the amateur or the professional exhibitor, for both are needed to make up a large exhibition and they both get benefit from meeting and from the exhibitions, but it makes it more difficult to run an exhibition satisfactorily than it would be if the exhibitors were either all amateurs or all professionals. I think you will find that the strictly amateur exhibitor is becoming less and less a factor in vegetable and fruit exhibitions every year, and if such is the case, it is certainly time we were giving the subject serious consideration. It is not because the professional grower cannot grow as good specimens, or that he cannot arrange them as well as the amateur, that we should strive to keep the latter with us, but because he is carrying out the ideas of the founders of the horticultural and agricultural societies. If there were no large money prizes there would be no professional exhibitors, and no money prize is really worth any more than the face value of the prize; but if the prize had no money value the competitors might spend any amount to secure it. I am of the belief that every large society should offer some prizes, every year, that have other than a money value. There would be no use in offering such prizes if there be no interest in amateur horticulture, but it seems as though there should be gentlemen in this society who would like to compete for a gold medal, who would not think of trying for a money prize. Do not think that I would advocate substituting medals or silver plate for the money prizes offered at the present time, but if we could have one amateur prize at each of the large exhibitions and have it competed for with the same spirit that some of the cash prizes are, it seems to me it might revive an interest that I fear is fast dying out.

The offering of large money prizes has had a tendency to foster professional exhibitors, not only about the home of the societies offering such prizes, but back in the country as well, and it is a very great benefit often to the country exhibitor to attend the large exhibitions and compare his produce with that from other sections of the state. This makes it very important that these

large exhibitions be run in the very best possible manner, as the country exhibitors are many of them close observers, and when they go home it is very desirable that they carry the idea that the large society is run on broad principles and that the best exhibits get the best prizes. There is nothing so bad for any exhibition as to have the exhibitors feel that there is any partiality shown in the awarding of prizes or that the judges will not give every one an equal chance. It is usually claimed that there will be some kicking anyway, but those who get the prizes will be satisfied. The conscientious exhibitor, however, only wants the prize he deserves, and if he gets more he loses confidence in the integrity or judgment of the judges, and his opinion is very much the same if he does not get what he thinks he should have. The public is equally disappointed if the judging is bad.

Our subject is the growing and exhibiting of vegetables and fruits, and you may ask why I am considering judging. The amateur exhibitor may care very little for the opinion of the judges, but in my opinion he is not a large factor in exhibitions of today. The professional exhibitor spends more thought on what will please the judges at the exhibition where he intends to compete, than on the actual merits of the exhibits he puts on the table.

I prefer a single judge to award prizes, because if one man has to make the decisions he must use due care and have a reason for making them, bnt if there are a number of judges the decisions are usually a compromise, as no two will agree every time if the competition is close, and in such cases you get no one's judgment.

There can be no general rule regarding the proper size of vegetables or fruits for exhibition, but the present custom of exhibiting vegetables of a smaller size than formerly, is a great improvement. This applies particularly to such vegetables as potatoes, beets, carrots, and parsnips, as the tendency of these is to grow too large; but with such as salsify and horseradish, the larger they are (providing they are fairly smooth), the better. To have any of these roots in good condition to exhibit, they should be matured, or nearly so, and to get the plumpness and color which is desirable they should have an abundance of potash. In fact, I think that potatoes, carrots, and parsnips do better if grown on

a good fertilizer. A good coat of manure the season before, seems to do them good. Beets and horseradish will do nicely on heavily manured land. Carrots that are sown late seldom make nice exhibition specimens. They may attain good size, but lack in color and fulness. It is as necessary to have a carrot ripe to be in prime condition for the exhibition table as it is a strawberry. Many would say that to compare it to the Baldwin apple would be much better than to the strawberry, but I think there are few of our vegetables that are in their prime for the exhibition table for a shorter time.

The one vegetable of the rich and the poor that is in use during the whole year and on nearly every table once a day is the potato. It is generally grown by almost every one who has a garden, with the exception of those located near large cities, where the land is very expensive and there is a very large quantity of stable manure used; still it is not shown to perfection as often at it should be at our exhibitions, yet much better now than formerly. The tendency to give the prizes to extra large specimens is not encouraged now, and, as I have intimated before, the exhibitors are after prizes, so if the judges recognize only medium-sized, smooth specimens, those will soon be the kind exhibited. While I say "medium-sized" it will do to go rather above that size if the potatoes are good shaped and show no signs of coarseness, a defect which should never be encouraged. Whatever the size, the skin should be full. To grow potatoes that have all of the good qualities and none of the faults is not always an easy matter, and after they are grown it is often hard to find twelve that are alike, even when the crop is good. One can find two or three that will just suit him, but it is very often necessary to throw these aside and take some that are not so good, as a few extra nice specimens have a tendency to make poorer ones look poorer than they really are. It is probably much easier for any of us to recognize a nice plate of potatoes, than to tell just how to produce them. On general principles, potatoes are smoother and of much better quality when raised on new ground, not necessarily virgin soil, but the first or second year after breaking up, and where the animal manure, if used at all, is plowed well to the bottom and the potatoes are *largely* grown on chemicals or

fertilizers. A good, acid-cut fertilizer I consider best. A liberal amount of nitrogen and potash are essential, and there should be some available phosphoric acid; a combination of 4 to 5 per cent of ammonia, 7 to 8 per cent of available phosphoric acid and 7 to 8 per cent of potash, I think would give better returns generally than one not so evenly balanced. If you know exactly what your land lacks you can, perhaps, make up the deficiency; otherwise it is doubtful economy to try to save money by buying low-grade or poorly balanced fertilizers.

I have raised potatoes of fair quality and smoothness on very heavily manured market-garden land, but they are not a crop that responds to heavy manuring. To grow the best and handsomest potatoes possible, I would use no manure the year the potatoes are planted, but from 1,000 to 2,000 pounds of good fertilizer per acre; about one-half broad cast and one-half in the drill, thoroughly mixed, using large seed cut to two eye pieces, and planted about the first of May in drills from eighteen to twenty-two inches by thirty to forty-two inches apart (the latter distances for the late varieties). Give thorough cultivation and plenty of Paris green and Bordeaux mixture, and you should have potatoes of the best quality.

Perhaps there is no vegetable that is more often exhibited and wrongly judged than celery. Celery, to be good for the table or market, should have a head as much as lettuce or cabbage, and to get this head it is necessary to sacrifice the older leaves; in fact, as you bring the head to perfection you lose all of the outer leaves, but the same is true of lettuce or cabbage, and who would think of giving a prize to lettuce or cabbage because it had a great spread of leaves? It may be possible to sell these great bunches of celery leaves, but I doubt whether there is a dealer inside Faneuil Hall Market who would buy one; they know celery there. It seems to me that every horticultural and agricultural society should try to encourage the people to raise the best of produce, and that we have not always done this in regard to celery. Bunches of what I shall call "celery leaves" may occasionally be picked from among heads of good celery but the methods of growing the two are entirely different. To grow the bunch of celery leaves, the plants must have considerable

room and a long season of growth. They may grow quite rapidly at first, but should continue growing less and less as they near maturity, because a sudden start will cause the heart to develop, the outer leaves to soften, and a head will then begin to form. The older gardeners can well remember when there was a demand for big heads of *celery*, not bunches of celery leaves. I have seen them and have raised some, but do not try to grow them now as they are not wanted in the markets. I would not object to the awarding of prizes to large heads of celery, for it is one of the few vegetables to which size may be considered an advantage, but the point is *size of head*, not of *plant*. I have seen bunches of celery on exhibition which were from six to eight inches in diameter that had practically no heart. It should be the duty of the judges, where such celery is shown, to pick off the outer leaves from one of the heads so that every one can see how utterly worthless it is.

As I have spoken about growing the bunch of celery leaves, perhaps it would be well to say a few words about growing the heads of celery. The method early in the season makes but little difference except in regard to the size of the head. If you would have a shouldered head of nice proportions and not too tall, the plants must be set ten or more inches apart; but if you want nice celery for family use or market, from four to six inches should give a more satisfactory crop. To get celery of the best quality it must be grown rapidly and it is quite important that it should take a little extra start when we begin to blanch it. Celery that is banked with earth gets this start from the cutting of the roots, and the chance that those roots which are left get to work up into the soft earth of the bank. Perhaps the best way to start Golden celery that is to be boarded, is to give a good watering and work the ground about the time the boards are set up. This gives celery of fair quality; but no method will give as good celery in the early fall as can be produced later when the weather becomes cooler. Celery grown in this way will not keep so well as that of poorer quality.

There is one more point in the exhibition of vegetables to which I wish to call your attention, and that is, the danger of losing our type or of recognizing varieties that have no type of

their own. At the present time when every seedsman has to have something new almost every year, if you consider how many there are in the seed business you will see that our so-called *varieties* multiply rapidly, and while some of these may be entirely new a very large part of them are practically like some varieties that are already in cultivation. These exhibitions are supposed to be run to educate the exhibitors and the public, but if they are to be of any use in that line, the judges must see that exhibitors hold strictly to the type of the variety they exhibit. Exhibitors will often say that "I bought the seed for such a variety," and think that should be sufficient. While that may be all they can know about them at first, the judges should satisfy themselves about the type, and then stick to it. To illustrate this I will mention the tomato, of which there are a great many varieties of the same color, but with several distinct types.

I think that in the fruit exhibitions we find rather more of the amateur spirit than in the vegetable department, but the professional is here also, and is usually able to secure his full share of the prizes. In the vegetable exhibition as a rule we cannot consider size of specimens a very important factor, but with fruit it is different, as there seems to be no objection to large size in any of our fruits, provided that they have color and smoothness, and for that reason we may consider size of very considerable importance in fruit of all varieties for the exhibition table, but there are other things that must be considered. All dessert fruits, to be of value for market or attractive for home use, must be handsome in color and form. Cooking fruit, to be of the best quality, must be fair and fine-grained. So we have several things other than size to consider in the fruit exhibits, and I think it important that the judges of fruit at our larger exhibitions should try to encourage the growing of fruit of the best quality as well as of largest size; for instance, a very large apple of poor color and quality is of but little value, and a small strawberry of fine color and quality is equally undesirable, from a commercial point, at least, so we should consider that size and color must go together to make a perfect fruit.

Very many varieties of fruit are shown, especially at our agricultural fairs, long before they should be ripe, and there is an

endeavor to get a color similar to what the fruit should have when ripe, but this is all wrong, because we do not want Baldwin apples ready for the table in September, or Northern Spy in October.

Judges who consider color the most important quality of fruit, are likely to do more for the good of the fruit interests than those who consider size of the first importance; but the ideal fruit is one of good size and good color.

There is a difference of opinion among fruit judges in regard to imperfections. Some claim that a plate of fruit is no better than the poorest specimen, and they will often throw out a plate because of a defect in a single specimen, when those remaining are very much better than any other whole plate. Other judges claim that if the eleven are better than any other twelve, then they should have the prize. For my own part, I believe the latter are right, because it is the growing of the fruit we wish particularly to encourage. The nearer alike all specimens on a plate of fruit are, the better, but we must not let any of these technical points divert us from the objects of the societies, which were not organized to make professional exhibitors, but to encourage the growing of better produce. It may seem that I am giving too much attention to this part of the exhibition, but it is one that we should keep constantly in mind.

While size and color are in general the two most important qualities in the fruit exhibition, when we consider the peach, we should use a great deal of care, or we may encourage the exhibition of the product of disease. Perhaps there is no other fruit that is increased in size and color, as is the peach, by disease. It has been so that there was no use in showing sound peaches at some exhibitions, as the prizes were all given to prematurely ripened fruit. I have seen prizes for Early and Late Crawfords given to peaches between which one could hardly tell the difference. It is not uncommon to see the prizes given to ripe Elbertas and Crosbys early in September, when the sound fruit shows no signs of ripening. These displays of diseased peaches may take better with the public and are certainly more of an attraction than good sound fruit, but I believe they are against the promotion of horticulture.

Mr. Kinney, in the course of his lecture, exhibited a root of

celery showing the crisp heart and worthless, because tough and fibrous, outside stalks. He also exhibited an ideal Baldwin apple, which showed red in September and has since brightened. He said that we must consider size, whether we go above or below the normal. The smaller specimens are usually brighter in color and finer in grain than the larger.

Discussion.

Hon. James J. H. Gregory said that he had listened to the lecture with great interest and profit. There is a class between the amateur and professional,—the farmer, who exhibits partly for honor and partly for money. Mr. Gregory said that he is perhaps the largest exhibitor in Essex County, and he is convinced that there is no money in exhibiting vegetables. He never got more than dollar for dollar by exhibiting. There has to be a great outlay of time in selecting a dozen specimens of the same size. In this Society there is a varying standard. Weight and size are too much the standard here; quality should be the standard. We would not buy the squashes and onions which take a prize here for our own use. Prizes for squashes are often taken by specimens which are not ripe. If drawn in where the stem is joined, the squash is ripe. Hubbard squashes weighing seven or eight pounds used to take prizes which are now awarded to overgrown specimens that are worthless, and the societies are responsible for it.

He would depend largely on potash rather than on barnyard manure. If potatoes are thin you can plump them by giving them potash. He would give as much as ten per cent.

Thomas Harrison said that a potato thick in the middle is hard to cook. The shape of the potato is of importance. One long, and even all the way through is more easily cooked. He prefers the flat varieties.

The lecturer said that any potato wants to be as thick as the variety calls for or you get a poor potato. Some potatoes are naturally thick like the Hebron.

Hon. Aaron Low did not agree with Mr. Gregory as to the awards. The Committee have made the rule that onions, for instance, should correspond to the ideal of the variety shown. When

there have been large displays of foreign onions they have always given preference to the Danvers.

Varnum Frost thought Mr. Gregory a little wrong in what he said about squashes. He knows a ripe squash as well as Mr. Gregory. He used to tell one by sticking a knife in; now he strikes it with a stick. He says there is no money in getting up a collection,—it takes too long to find specimens alike.

The lecturer thought that low ground that is strong, so that it will not wash away or blow away, is good for apples.

Mr. Frost said it is a simple matter to grow strawberries. Nine-tenths of farming may be learned from observation. Prizes should be awarded for the largest and handsomest strawberries. The Marshall is the best of all. Many people are disappointed in the Marshall because they do not know how to grow it. It will not do to set the Marshall on land that is sour. It must not be set on land that settles and will be hard. The rows should be four feet apart and the plants eighteen inches apart in the row. The plants should be elevated two or three inches above the level of the row. Set the plants in August; if as late as the middle of August, let no runners grow. Avoid walking near the plants. Clay is needed if you wish to get the largest berries.

Samuel H. Warren said there are but few localities where the Marshall will grow well. There are many kinds nearly as good as the Marshall of which you can get ten quarts to one of the Marshall. The Ridgway, originated in Indiana, is one of the best for the home garden. It will give three times as many berries as the Marshall. It is not quite so large and the color is not so good, but it is a splendid strawberry and you can rely on it. The Sample is very handsome and very productive, but it lacks quality.

Mr. Frost said every plant should have a hundred square inches. He finds no variety that will yield as many berries as the Marshall. If they do not yield well it is because people do not know how to grow them. He knew of a man in Lincoln who had a bed of strawberries planted so close that the sunlight and air could not get in. The bed was so handsome that he called his neighbors to see it, but he did not raise a berry.

Mr. Low thought there is no fruit of which you want to know

so much as the strawberry. If you have a clay soil the Marshall is the ideal berry. Some varieties need a sandy soil. Thirty or forty years ago the Hovey's Seedling was the ideal berry. You must know what kind of land you have got and plant varieties that will grow on that land.

Mr. Gregory said that Russet apples are most successful on land with a large proportion of clay.

The lecturer would use no manure on grapes. Bone is better, but it acts slowly. The wood should ripen early. In the ideal vine the joints are short. If your ground is rich, mulch it with hay rather than manure. The secret of growing grapes is to get good wood. He uses bone and ashes and some sulphate of potash.

Mr. Harrison had spread lime and wood ashes over leaves on the ground.

The lecturer said that to grow the best quality of apples he should not work his orchard at all. It is practically impossible to get very large fruit from land that is not worked, but the quality is better. Apples are not as firm or as high colored in cultivated ground as in pasturing. He advised a man in Newbury who had had no apples from his orchard for three years with clean culture to lay it down to grass, seeding thinly. There is no way to keep grass out of the orchard so well as by cows. It is well to work a young orchard until the trees get to bear a barrel or two. He would not have a limb so low that a cow could reach it. The fruit is not so good from a tree branching low. Train up high and let the limbs hang down. As trees begin to bear the ends of the limbs die off. He would make a new tree by pruning. If a tree is growing fast a large wound will grow over quickly. You want new, bright wood. Apply no fertilizer under the trees. The place to apply it is in the centre of the rows. The speaker was convinced that trees should be scraped and then painted over with Bordeaux mixture. There are many insects under the scales but he would not cut into the live bark.

Mr. Gregory said he had an orchard which bore little fruit. He scraped the trees and they bore better the next year. Baldwins from uncultivated ground keep better than those from tilled land.

A vote of thanks was unanimously passed for the lecture.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, February 16, 1901.

A meeting for Lecture and Discussion was holden today at eleven o'clock, the President, O. B. HADWEN, in the chair.

The following lecture was delivered:

THE ADVANCEMENT OF MARKET GARDENING IN THE PAST TWENTY-FIVE YEARS.

By MICHAEL SULLIVAN, Revere.

The question is often asked, what is market gardening? We find the kitchen garden, originally devoted to the cultivation of culinary vegetables for private use, enlarged so as to admit a commercial side, and a continuous enlargement caused by demand of local and surrounding communities.

The kitchen farmer or gardener has moved up a degree to the commercial or market gardener.

Horticulture, the twin brother of market gardening, on account of its close relations and the use of the greenhouse and hotbed in forcing crops, and the propagation of plants by each, can well be classed with market gardening as one and the same business. There is a difference between this and agriculture, owing to the small area of land required in the operations of one and the large area required by the other. The manner of cultivation, and large variety of crops produced well make a distinction.

The business of market gardening in the neighborhood of all cities increases always on a scale proportionate to the greatness and wealth of the city, and its progress and development will depend much upon the demand for the crops which can be produced profitably in the vicinity of those cities. Boston and surrounding cities have long been noted as having the most exacting markets in the United States as to the quality and neatness displayed in the preparation of all fruits and vegetables offered for sale.

The result of this continuous demand for the best, and the good prices generally to be obtained, have been the cause of son succeeding father in the line of producer, generation after generation;

and this going on since the early settling of the country, has resulted in as high an order of intelligence as can be found anywhere in the world where market gardening or horticulture is carried on. They have been the founders of this grand Massachusetts Horticultural Society, whose good work is spreading throughout this great country, their great Boston market speaking at all times for the quality of their good work.

The changes and progress constantly going on in all lines of human effort are to the ordinary mind at times almost incomprehensible; that in the space of one life of average duration, one can see those great changes and improvements may well be called a Divine favor.

Along with all other lines of human work, that of the agriculturist has kept pace, and has advanced wherever science and scientific knowledge have availed. The agriculture of fifty years ago, whether on the farm or in the market garden of those days, seems as remote and ancient in comparison with modern methods as would the workshop of the manufacturer or the machine shop of the most skilled mechanic of those times. Still old Mother Earth, the foundation of all wealth, remains the same.

The tillage of the soil and preparation for the seeds are not the only improvements; the hand of science has come to the aid of the agriculturist, and whether applied on the farm or the market garden, this aid has been of material advantage.

Who but the practical engineer and scientist could explain the advantages of underdraining the soil, transforming thereby what was before a waste into a productive and fertile field; who but he, could so well explain that by underdraining, the wet and soggy soil could be made warm and productive, so that the full benefit of the manure which might be applied could be made available. And so on, step by step, the scientist directs the practical hand of the farmer and market gardener, changing the old time farmer himself into the practical and scientific market gardener of today. Every day on every hand we are told that we are living in an age of progress.

In looking backward a quarter of a century, with all its changes, time seems short in comparison with the twenty-five years yet to come, and now, in the very beginning of the first quarter of the twentieth century, there can be no doubt but the advanced intelli-

gence and the high education of both men and women, must largely exceed that of the past quarter century.

The advancement and development of market gardening in the past twenty-five years is a subject well worthy of a pen more able than mine. However, thirty years and more of continuous labor in any line should leave one master of his business.

The market garden, more than any line of agriculture, should be worked on strictly scientific principles; that is, exact knowledge of the requirements of all the crops under cultivation, whether in the open field or under glass.

A close study should be made first of location and approaches thereto; then soil —its composition, both of surface and subsoil, and perhaps climatic changes caused by location, for it may be near the ocean, and therefore have less snow to contend with — or inland, with its late and early frosts, and heavy and destructive showers in the growing season. Along all these lines science now comes to the aid of the intelligent market gardener.

Books on market gardening written and published at the beginning of the past quarter of a century, classed at that time as "standard works on American gardening," plainly show its advancement and development, when compared with the standard works written and published today. While there were to be had excellent standard works on agriculture and plain farming, very little of value could be found on the subject of market gardening.

"The Field and Garden Vegetables of America," by Fearing Burr, Jr., was published in 1865. "Market Gardening for Profit," by Peter Henderson, 1866, was the first and most valuable practical work published, which was then available to the American market gardener. This book, more than any other published in this country, opened up the entire field of commercial gardening. What were considered "trade secrets" before its publication, were made available to all, and the enlargement and spreading out of the market gardening business all over the country can well be dated from this publication. Here, in a condensed form, is printed information as to those who are best fitted for the business, the monthly calendar giving directions to guide the practical gardener throughout the year.

The time has long since gone by when the average farmer or

market gardener took the view once credited to him, that information obtained from books was of no value. The agriculturist and market gardener require the best books for their study as well as the archictect or mechanical engineer, for in either case the books are an essential part of the tools to work with. Today books are to be had on almost every conceivable subject in agriculture and the growing of special crops. What was once guarded as a trade secret is now found written in books, magazines, and the agricultural newspapers. Therefore I shall leave out all detail in this paper as to the growing of crops or the preparation of the soil, only referring in a general way to the great changes so rapidly taking place.

Again referring to the most advanced work published in 1866, how ancient and primitive seem the greenhouse and forcing pit of that time compared with those of today. But it can well be said, the instructions were all there, and the foundation for the large operations now going on in all parts of the country, was then outlined in this little book.

The valuable publications of the Hatch Experiment station, at Amherst, and the equally valuable publications of this Horticultural Society, together with many others that might be mentioned, present to the gardener of today unlimited sources of information.

Certain locations in our State are noted as leading in special lines of work and invention. Lynn for its shoe manufactures; Lowell for its cotton mills; and so Arlington and Belmont can well be called the leading centre of new and progressive ideas in market gardening. In order to verify this, look at the magnitude of their greenhouses and well tilled gardens. By the use of those immense glass structures, some of them six hundred feet long by fifty feet wide, the field operations are continued, enclosing smaller fields for the winter growth of vegetables.

To such assured success has this attained, that one of the largest growers has said that he was as yet undecided as to which was the cheapest, whether he could not grow the highest quality of vegetables as cheaply under glass as in the open field. This, when understood, may yet come to pass, for at this date a process for cleansing the soil, called sterilizing, is known which will make it possible.

Here again has science come to the aid of the horticulturist and market gardener. The Experiment Stations are entitled to due credit for this already assured success, made so by the larger appliances and conveniences of the scientific market gardener, who has already applied this method in the successful growing of immense quantities of lettuce.

Upon further experience it may be found that by sterilization of the soil, perhaps the entire list of fungus diseases can be easily controlled or wiped out; also the expensive fumigation of greenhouses may be rendered unnecessary.

Two years' experience has as yet but partially demonstrated its full value to the market gardener; already a patent machine for soil sterilization is on the market, which indicates that it is somewhat beyond the experimental stage. Those who are carefully studying results, are already able to say that they think this discovery one of the best and most valuable of recent date.

A process of sun sterilization may yet cheapen and simplify this valuable discovery. From the management and care of the old time hotbeds of twenty-five or thirty years ago, consisting of only a few three by six foot hotbed sashes in many of the best market gardens, has sprung the care and management of the immense greenhouses now so successfully worked, just as from the old time cobbler's shops at Lynn, have come the great shoe manufactories, and the care and management of all their fine and complicated machinery.

It is nothing strange now to find the products of Massachusetts greenhouses on the banquet tables of Chicago and all the other leading cities of the United States.

Cucumbers, once considered so difficult to grow in winter, and as yet so expensive, are now produced at all seasons, and the markets are kept well supplied throughout the winter. In growing this crop, staminating the blossom, which is done by the bees in spring and summer and considered absolutely necessary for success, can now be done by artificial means. Twenty-five years ago only a limited knowledge was had as to its requirements. This applies to nearly all the garden fruits and vegetables, and is fairly understood at the present time.

The Boston Market Gardeners' Association, of which I am

pleased to be a member, was organized in 1886, and was the first in that line in the United States. W. W. Rawson, who was elected its first President, is still holding that position, and has shown himself one of the most able, advanced, and progressive market gardeners engaged in the business. The benefit resulting from this organization, now of fourteen years standing, is of much importance. Valuable lectures are given by the best professional ability from the various agricultural colleges; also papers are read by the different members, treating on special crops in the cultivation of which they might well be classed as experts, the presentation and reading of which before one of the most experienced and enlightened bodies of men engaged both in agriculture and horticulture in the United States, creates discussions of value to members and all those present. Its members are largely members of this Horticultural Society, and are working mutually for the benefit of both.

Other States are now copying them, and similar associations will result throughout the country in or near the large business centres.

While the business of market gardening is not what it once was, neither is any other business; still it may be said that there are but few lines of business contending now with the competition from outside and which did not exist twenty-five years ago. California, the great West, and the sunny South, are now getting the cream of prices by their early, and with us, unseasonable, productions, now that transportation is so cheap over the great lines both by land and water, daily and weekly connecting distant sections of this great country, constantly supplying their best fruits and vegetables to our market. All this tends to discourage many, and only the courageous capitalist, who can afford to purchase modern appliances, is now making any profit.

Market gardening has laid the foundation of many a fortune in years past, and a good living and a comfortable country home still await those who will fulfill its hard and exacting requirements, and who wish to till the soil.

There can be no question that there has been great improvement in the modern appliances for irrigation of the field crops and the greenhouse, requiring the expenditure and outlay of large

sums of money; also in the use of insecticides and poisons for the spraying of fruits of the orchards and field and garden crops, producing results in quality as well as in quantity which without them could not be obtained.

The proper use and value of the commercial fertilizer for farm and market garden crops is now well and carefully studied, and the guesswork of twenty-five years ago as to their application is no longer needed by the intelligent farmer or market gardener, and he is able to place a more just value on stable manure, that always reliable and best of all fertilizers.

But all these advancements have brought their burdens also, in the shape of increased taxes. The near-by market gardeners are now suffering from burdensome and often unjust taxation. Situated within the rapidly growing towns, and near large cities, they are compelled to carry their proportionate part of the expensive improvements in the central portions of those towns, often receiving but little or no direct benefit therefrom.

The solution of this problem can only be found in the gradual absorption and cutting up into house lots, of those farms, thereby compelling those continuing in this line of business, to move back where lands are to be had cheaper, and where therefore taxation is lower. It is the opinion now of many, that this condition should be adjusted, even by legislation if necessary, so as to give encouragement to those who are continuously doing so much for the advancement of agriculture.

That New England has led and will still continue to lead in all the new lines in agricultural development, in improved methods in market gardening and horticulture, is now plainly evident. This year, 1901, the first of the new century, Boston, ever progressive, still in the lead, will open to the public her new and grand Horticultural Hall, the finest in this country if not in the world, where the coming generations can continue the famous exhibitions which have been given here in this old hall, with all its pleasant associations in the past, and which have given pleasure as well as instruction to thousands; where the work of exhibiting the productions of the market gardener as well as the choice and equally skillful work of the horticulturist, having ample room each and all for the exhibition of every kind, can still go on—Boston, the home

of education, with always new and advancing ideas, her best men continuously studying out, always for the greatest public good, not alone in her grand buildings for State Capitol and Municipal uses, but also for Music and the Drama, as well as Horticulture.

Quincy Market, the grand conception of the elder Mayor Quincy, built under his direction and providing standing room for the farmers' produce wagons on South Market Street, was once the best market in any city in the United States. But the Quincy and Fanueil Hall Markets, once ample, are now fast becoming insufficient, owing to the very rapid increase of population and business, requiring for both buildings and surroundings a much larger area than is now within the market limits.

Boston ought to do something for those worthy tillers of the soil, who do so much in constantly supplying fresh and healthy produce for its inhabitants. Quincy Market should be extended to Atlantic Avenue, and a covered shelter stand should be provided for the market gardener and farmer; such an enlargement would do credit to the City of Boston, which should retain full control and ownership of the whole. The contemplated cutting of a street through Quincy Market, thus lessening the farmer's limited privileges on South Market Street, should not be allowed.

Why should Boston overlook and neglect her Market, always in the past considered of so much importance? That the advancement of market gardening may be encouraged within this grand old Commonwealth of Massachusetts, is the hope and desire of those engaged in this most worthy occupation, that they may do their State credit in the future as they have done in the past.

In our day the people of wealth who daily go in their carriages to Quincy Market to order their table supplies of fruits and vegetables, the man of moderate means, and the poor man who takes his basket to the market, can all buy, according to their means, the luxuries of the season as well as the necessaries of life, there so temptingly displayed; and all this is the handiwork of the market gardener and modern farmer. Full credit should be awarded to them for the bountiful table which the poor man can so cheaply furnish at the present day.

The taste for many kinds of vegetables, when first introduced

into our markets, is largely an acquired taste, so that their growing is unprofitable to the market gardener, and therefore the production for many years, remains limited until the daily demand increases and a good market is secured.

The Tomato, for instance, required years before it found its place as a popular vegetable for general use, while today tons of this excellent and healthful vegetable are sold in every market throughout the country.

The abundant production and large market supply in its season of the appetizing Celery, once so limited in supply in our market that only the wealthy could afford to purchase, bring it within the reach of all, and this excellent table vegetable can now be purchased cheaply everywhere and may be well called a boon to the city dwellers and to humanity.

The abundant supply of Asparagus also, in its season, supplemented by early supplies from the South, can be appreciated and is by those who know its value as a food as well as for its medicinal properties.

The early spring market once so profitable to the skilled Boston market gardener, now no longer exists, except for those gardeners who, with their greenhouse and hotbed products, can compete with the South. The Southern and California fruits and vegetables are now supplied to our markets in overflowing quantities, and hereafter the competition from all outside sources will tend still further to diminish the encouragement for local production. However, the climate and favored locations of soil and situation, nearness to market, etc., will always remain factors to encourage those wishing to continue in market gardening and fruit growing here in Massachusetts.

Discussion.

Hon. J. J. H. Gregory thought the meeting much indebted to the lecturer for the broad and sensible handling which he had given his subject. About sixty years ago he and his brother sold in his native town, Marblehead, the first tomatoes. They brought, green, three cents a pound. There was then only one kind. At that time the only beet besides the Long Blood was the Turnip Blood; the Bassano was introduced soon afterwards.

There were Tory Beans, Bush Beans, China, then sometimes called the Skunk Beans, and the Sieva or Small Lima. Sweet Corn was hardly known; it was then called French Corn; the first variety introduced was the Darling. It came into use rather slowly. The only carrot was the Long Orange, and the only cucumber the Frame. The only cabbages were the old English Drumhead and the Long Stemmed Savoy. Of potatoes there were the Early Hill and the Long Red. Onions were then for the most part sold in traces; the Strasburg was the yellow variety, and all our other varieties of yellow, of which the Danvers was one, were bred from it. There were only hard yellow peas; the wrinkled sorts were not known. Fairbeard's Champion of England was one of the first and still remains one of our best. The only dandelions seen in the markets were wild ones, dug in the fields. The only melons were soft, yellow, oval "mushmelons." The Crookneck was then about the only squash; the Marrow was introduced by John M. Ives at about the time Mr. Gregory was speaking of. The true original variety is now lost, but if we could find out where they came from we might renew them; probably they were from Brazil. The true Hubbard has no soft shell; they begin ripening near the stem and the shell hardens.

Varnum Frost said that much stress had been laid on modern science, but we get no good squashes now. The barrel boxes which are filled with two or three dozen heads of lettuce are one-half salt hay. He used to pack cauliflowers solid; now eight cauliflowers carry three times their weight in lumber and rubbish, and loads are piled ten feet high that might be carried in a light wagon. Is the quality of vegetables as good as it was fifty years ago? It is nonsense to say that farming cannot be learned by observation.

The lecturer said that market gardeners in Arlington and Belmont had been stuffing their soil so full of manure that the quality of the vegetables raised on it had deteriorated. The quality cannot be expected to be what it was on virgin soil thirty years ago or more. He thought it might be well for a market gardener to lay down one-half of his ground to grass alternately to rejuvenate it.

Joshua C. Stone said that in what had been said by the speakers who preceded him there was not one word of encouragement to

young men to go to farming. A man makes a profit of five thousand dollars a year of receipts over expenses, but he has a hundred thousand dollars invested in his plant, and makes no account of interest. The speaker had been in the business forty years and has four sons, not one of whom would take the farm if he would give it to him. He can grow cucumbers every week in the year, but no man can grow them at a profit to be fit for use before this time. Greenhouses are no profit to any man in connection with a market farm, but a man who gives his whole attention to them might do something. No man can get a living on land worth two thousand dollars an acre.

Warren W. Rawson thought that the lecturer had covered the ground well without going into details. The speaker could go back forty years and could remember when two hundred hotbed sashes was a large number for one market gardener to have. Today two thousand is not a large number for one grower, and this besides several acres of greenhouses. Six dozen heads of lettuce would then go in a barrel box; now two or three dozen will fill it. The speaker is not discouraged at low prices, for the market has greatly extended, and the productions of Boston market gardeners go as far as Chicago and Canada. He had never known a year when cucumbers did not bring twenty dollars per hundred in February, and he has sold them for fifty dollars per hundred. Lettuce has brought two dollars and a half per dozen. The telegraphic advice today was to ship light, for there were large quantities from the south. The speaker thought we can grow vegetables here as cheaply as at the south. Nothing is so important as sterilization of the soil; a machine has been invented for the purpose, and the speaker thought it would rid the soil of insects and save fumigation.

Mr. Rawson thought that sterilization would destroy many insects. Since he practised it he had seen very few green flies.

The lecturer said that in the paper which he had read he had touched on the inducement to the younger generation to engage in market gardening, for there is a living still remaining to the business. It will not produce millionaires, but it has laid the foundation of fortunes, though this was largely from the rise in the value of land; but this applies only to the vicinity of Boston

and other cities. If he had his life to live over again he knew of no position in the community more independent than that of the market gardener.

Mr. Frost said that there is four times the amount invested in market gardening in Arlington that there was forty years ago, but it does not put so much money into the farmers' pockets. Any man can bring up a family and lay up two thousand dollars a year if his father leaves him a hundred thousand dollars.

The lecturer said that thirty-five or forty years ago, in war times, the market gardeners' wagons were met at the ferry by the market men with the cry, "Sell it to me, sell it to me!" and the gardener made his own prices. Then was the time when the farmer had a large bank account and paid off his mortgage. Prices were almost fabulous; tomatoes brought two dollars per bushel by the wagon load, and all other farm produce brought proportionate prices.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, February 23, 1901.

A Meeting for Lecture and Discussion was holden today at eleven o'clock, the President, O. B. HADWEN, in the chair.

The following lecture was delivered:

A QUARTER CENTURY'S EVOLUTION IN AMERICAN HORTICULTURE.

By PATRICK O'MARA, New York, N. Y.

The phenomenal progress made in horticulture during the past few years may well supply a theme for the essayist, provide food for thought to those engaged in its development and prove an interesting study for those even remotely connected with it. While horticulture generally has made great strides forward, the most pronounced progress has been in floriculture, particularly in the growing of cut flowers to supply the great cities during the winter season. It is in this particular branch of floriculture that American horticulture can justly claim precedence over all others and

although the scope of this paper is not limited to that alone, a review of it will form the principal part. So pronounced is the advance in greenhouse construction, in methods of growing, in business methods, in the varieties of roses, carnations, chrysanthemums, geraniums, cannas, and other flowering plants, that the progress made may well be termed evolution. Coincident with the advance made in growing, and equally pronounced, is the great change in the retail stores; in fact much of the change in the growing must be credited to the enterprise of the retailer. This is somewhat debatable ground but it is not vitally important; the great point is that progress has been of a necessity coincident.

My first actual contact with the great New York cut flower market took place in the winter of 1874–'75, when I was sent as an assistant to my elder brother to carry an extra basket, occasionally, in his wake, and sometimes go off on an independent route to sell. It seems incredible, in these days, that one man carrying flowers in a basket, with a boy to help on very busy days, and the use of a horse and wagon at Christmas and New Year's, would dispose of about $35,000.00 worth of flowers annually, but such is the fact. The horse and wagon at the times mentioned were necessary largely because of the increased bulk of Poinsettia, which was a "pièce de résistance" in those days, and which, by the way, is just coming back into fashion again. A large basket, such as was in general use to carry cut flowers then would hold an amazing lot of flowers and the prices were gilt edged, $20.00 to $25.00 per hundred for Le Pactole, Lamarque, Safrano, Isabella Sprunt and Bon Silène roses, and even $30.00 per hundred for Douglas. Small roses like these, cut with stems about a foot long in the extreme, did not take up much room; carnations picked short and a few perhaps on stems about six inches long; double white Primula picked short; *Stevia compacta*, Bouvardias, Abutilons, bunches of Heliotrope, *Chorizema varium*, *Lilium candidum*, *Euphorbia Jacquiniæflora*, Tuberoses, Lily of the Valley, Eupatorium, Allamanda, Begonias, Dutch bulb stock, *Jasminum grandiflorum*, Callas, Violets, Sweet Alyssum, Mignonette, *Clerodendron Balfouri*, *Eucharis Amazonica*, leaves of *Cissus discolor*, Smilax, leaves of Pelargonium Madame Pollock, Rose Geranium leaves, fern fronds — anything and everything in the

shape of flowers and foliage could be sold in the early part of the last quarter century. It required considerable diplomacy and tact on the part of the seller during the busy season to steer clear of the too prying buyer in the stores. The various flowers would be done up in separate packages, some reserved for particular customers. The camellia was still in the market when I first began, but was rapidly passing away and shortly after disappeared absolutely. It is interesting to note that camellias were very much in evidence among the flowers used at the funeral of the late Queen of England and that there is every evidence of a revival in them. Thus do fashions change, and the favorite of today may be the despised outcast of tomorrow. The double white Primula was a staple at the time of which I speak and was largely used in funeral designs. We grew a house of it one hundred feet long and found it very profitable. Tuberoses were a staple, too, and one of the best paying crops. We would realize a thousand dollars and over from a house one hundred feet long and ten feet wide, besides raising a spring crop of bedding plants on the same space. In these days of fifty cents per square foot per annum, the wonder is that more florists did not get rich in those halcyon days. One of the local florists on Jersey City Heights made a specialty of tuberoses and amassed a competence from it while the "boom" lasted. These were still the days of the stiff table design, flat basket, hand bouquets made with flowers wired on broom corn, little boutonnières made up with a green leaf for a background and anything handy. Orchids, with the exception of *Cypripedium insigne*, *Dendrobium nobile*, *Bletia Tankervilleæ* (or *Phaius grandifolius*), *Peristeria elata* and Zygopetalum were practically unknown, and only a few of these found their way to market, mainly from private collections. The glorious Cattleya had not yet made its appearance. There is a well authenticated story of its first appearance in a Broadway, New York, flower store. A noted beau who called in every morning for his boutonnière was always looking for something new. The proprietor had obtained a Cattleya flower and had it safely stored in the ice box awaiting his appearance. He came. Reverently the flower was placed in his buttonhole; silently he was turned toward the mirror. There was an air of mystery, the play of an artist, about the whole performance and

then, the climax, $25.00 for the flower, which was paid with alacrity. It is further stated that for many days thereafter the same gentleman called regularly as usual for his orchid, but the price had dropped to $15.00. No wonder that some of our millionaires decided to go into the business of raising them. It is difficult to get statistics on cut flowers which are reliable, but from the best information obtainable I feel safe in saying that the value of orchid flowers sold annually in the New York market for several years past will not fall short of $100,000.00. This is only one of the many features in the evolution of floriculture.

It was about 1875 that the first decided ground swell in the coming evolution in floriculture was felt, and although it did not manifest itself forcibly for several years thereafter yet it is comparatively easy to trace at this time. All eyes were being turned toward the rose. The varieties then being grown were far from satisfactory; larger flowers and a better grade were demanded, and the supply was forthcoming. Better greenhouse structures were needed and these too were soon supplied. Madison, N. J., began to assert itself. The growers there began sending in Cornelia Cook, and a great revelation it was! Gen. Jacqueminot was artificially rested and forced into flower, the buds bringing from $1.00 to $2.00 each. William Francis Bennett and Pierre Guillot were tried in an effort to provide the desired red rose in winter and failed. Duchess of Edinburgh received a limited trial, but was found wanting. Souvenir de Wootton made its appearance and held its own until the growers got to understand the needs of Meteor, which has since held the field until challenged by Liberty, to which it has not yet relinquished it. Souvenir d'un Ami held place for a time, under an alias at first, but was unable to hold its place against the grand Catherine Mermet, and the day came when her fair daughter, Bridesmaid, drove the parent from the market. The Bride, another daughter of Mermet, quickly drove Cornelia Cook and Niphetos into obscurity. Perle des Jardins eclipsed Maréchal Neil, and Sunset, daughter of Perle, had her day only to retire into obscurity even before the parent. About 1885 the great forcing rose of that and the present day was ushered in as American Beauty, a seedling it was alleged discovered in the gardens of Hon. George Bancroft at Washington, D. C. A

very pretty story, and true as far as the introducer knew at the time, but since identified as Mme. Ferdinand Jamain, introduced by Lédéchaux ten years before. This grand rose has surpassed the most sanguine predictions of the prophets, and up to the present time is without a rival. One daughter, — American Belle — has passed to the "great beyond," but another and fairer daughter has made her debut, viz.: Queen of Edgely; whether she can move in the same orbit has yet to be determined. Mme. Hoste, Mme. Cusin, Mrs. J. Pierpont Morgan, Mrs. W. C. Whitney, Belle Siebrecht, Mme. Caroline Testout, La France, Souvenir du President Carnot, each have had their day; some of them are having it still, but a comparatively small day it is. Kaiserin Augusta Victoria is one of the varieties which has come to stay. Papa Gontier, from which Mr. John Henderson reaped a goodly harvest, has gone too. Golden Gate, for a long time in undeserved obscurity, has emerged into the effulgence of what seems a passing day. Mme. de Watteville, Mme. Pierre Guillot, Mme. Capucine, Duchess of Albany, Puritan, and Waban, from which much was expected, file past in our memories; some are fair ghosts of vanished expectations. I beg to digress for a moment to observe that I have not attempted any exact chronology in the appearance of these varieties, deeming it needless. It appears worthy of note here that as a rule the varieties most loudly heralded when they first made their appearance have not held the field with those which modestly entered the arena. The reaction from over-praise, or the result of over-propagation may be the cause. The demand for larger roses already mentioned resulted in the forcing of Hybrid Remontants besides the Gen. Jacqueminot, and for a while we had quantities of Ulrich Brunner, Mrs. John Laing, Baroness Rothschild, Rodocanachi and others. One New York grower for several years sent in Heinrich Schultheis under an alias with profit to himself. Anna de Diesbach held sway for a time as Gloire de Paris. The old adage that "there are tricks in every trade but ours" holds good even with horticulturists. It is somewhat remarkable that, of all the varieties of roses tried for forcing, the great trio remaining are distinctly American, — The Bride, Bridesmaid, and American Beauty. We should not be asked to relinquish all claim to the latter; at all events it was discovered

here. As Columbus could not create a continent he did the next best thing,—discovered one. At this date it would seem useless to set up the claim that it might have been a seedling after all; certain it is that nowhere under the sun are such American Beauty roses produced as in this country. The Dinsmore rose was a seedling beyond all question, raised by Wainwright of Trenton, N. J., yet it is practically identical with Madame Charles Wood. The Trask Grape is identical with Brighton, yet both were seedlings raised hundreds of miles apart; the former was raised first and never got upon the market, while the latter was introduced and brought some deserved fame to its raiser.

Next in importance to the rose as a cut flower comes the carnation. The development in this has been even more marvellous than in the rose. Statistics in cut flowers, as before observed, are very unreliable. Mr. John Thorpe, at the first meeting of the Society of American Florists in 1885, stated that the number of roses then produced for cut flowers in the United States was 24,000,000 and of carnations 120,000,000, to which should be added 6,000,000 roses and 30,000,000 carnations grown in private greenhouses; these, of course, were actually competing with the commercial output. Miss Emily Louise Taplin made a similar statement in 1886, probably borrowed from Mr. Thorpe. Professor Galloway in the "Year Book of the Department of Agriculture" for 1899 estimated the number of flowers sold as follows; roses, 100,000,000, carnations, 100,000,000, to which add 25 per cent for the quantity grown in private places. Here is a wide discrepancy and it is introduced here merely to show that it is such. Probably a figure midway between the two would be nearer the truth. Miss Taplin, in the statement above referred to, estimated that the total glass area in the United States was 3,200,000 square feet, an estimate out of all proportion to the alleged product. Professor Galloway in 1899 estimates the amount at 24,500,000 square feet, averaging 2,500 square feet to each florist. I think this average could be reasonably increased to 3,000 square feet, to include cold frames and hotbeds, which would bring the total up to 30,000,000 square feet in commercial use for the production of flowers and flowering plants, some portion no doubt being used for vegetables. Add to this the vast

amount of glass used by market gardeners and private gardeners, at least 50 per cent of the foregoing area, and we have a fairly accurate idea of the importance of horticulture at the present day in the United States.

But to return to the carnation. The growing demand for the flowers, the evident need for a better grade, and the apparent necessity of "booming" the flower were causes that led to the formation of the American Carnation Society in 1891. This organization has been wonderfully successful along its chosen lines, and the aims originally outlined are being realized each year. The much quoted "Thorpe's Ideal" carnation, viz.: one four inches in diameter on a two foot stem, is not so far away. The development of the carnation in this country is distinctively American. The varieties in use have been raised here, the methods of culture have been perfected here. From Hinsdale to Prosperity; from Portia to America, G. H. Crane, and Adonis; from President De Graw to Lizzie McGowan, Flora Hill, Alaska, White Cloud and Norway; from La Purité to Tidal Wave, William Scott, and Mrs. Thomas W. Lawson; from Miss Joliffe to Daybreak; from Charmer to Mrs. George M. Bradt and Olympia; from Astoria to Buttercup and Gold Nugget; from Rosy Morn to The Marquis and Genevieve Lord; from Crimson King to Gen. Maceo, Gen. Gomez, Egypt and Gov. Roosevelt — these indicate the giant strides made but tell little of the patient, intelligent efforts of the hybridizers. It is a record of which American horticulturists may well feel proud.

The violet, that other important member of the cut flower family, has grown in importance with the others. Its history does not contain as much of interest as does that of the rose or carnation. New double varieties (alleged) have been introduced but they are after all only strains of Marie Louise. New single varieties have been introduced, much superior to the old Schoenbrunn, but the great demand is for the double ones.

The chrysanthemum, which forms a by-crop in the cut flower market, exhibits one of the most wonderful efforts in American horticulture to develop and popularize a particular flower. To Mr. John Thorpe is due much of the credit for this. The exhibitions in New York, beginning in 1886, those in Philadelphia

and Boston, the importation from Japan of the collection containing Mrs. C. H. Wheeler and other good sorts, the importation in 1888 containing Mrs. Alpheus Hardy and other valuable varieties, (an importation, by the way, which has a romantic story attached to it of gratitude from a Japanese youth to the lady whose name the variety mentioned bears), importations from England and the continent, the rapid production of seedlings of pronounced merit here,— all combined to set afloat on the sea of popular favor the glorious "Queen of Autumn." It is highly creditable to our cultivators that well among the best varieties in the world today are found varieties raised here. The stamp of fashion was set upon the Chrysanthemum and although the fickle jade has somewhat changed in her attitude of late, particularly in the East, yet the impetus given carries it along and will undoubtedly do so for years to come. In hundreds of the smaller cities throughout the country, as well as in the large ones, the annual chrysanthemum show is a settled institution and this year there is to be one in New York on a magnificent scale.

Now let us glance at the evolution in the plant trade. It is divided, let us say, into five sections. The catalogue trade, the rooted carnation cutting trade, which is a branch really of the cut flower trade, the market florist near the large cities, who grows soft-wooded flowering and ornamental foliaged bedding plants for market and cemeteries, the grower of decorative plants, such as palms, for the city retail florist, and the florist in the smaller cities and towns who supplies a local trade almost exclusively. The first mentioned is perhaps the most important and most interesting. It is this branch of the trade which mirrors, and in a sense molds, public sentiment. Ever on the outlook for new plants and improvements in varieties, ever on the *qui vive* to gauge the popular taste correctly, the men engaged in it have to decide what to take up and what to drop; and as the majority decide, so it will be in nine cases out of ten. The catalogue man reaches where no florist or seedsman has yet ventured. The seed box at the the country store cannot; it is inadequate to satisfy the aesthetic sense of those who hunger after the finer grades of flowers and this want the catalogue and its publisher fill. The catalogue is the great vehicle for the distribution of horticultural literature, much

of it being sent gratuitously or as a premium on orders. The advertisements in the great magazines, in the weekly press and in the rural publications supply the inspiration for many to begin gardening who otherwise would never attempt it. The traveler for the catalogue man, particularly in nursery stock, the "home agent," the "club organizer," the local expert who has carried off a prize for the best this or that offered by the catalogue man, these are potent agents in the evolution of American horticulture. They are part of the great machine and although they are railed at by very conservative people, they are essential. It is in the wake of these that the local florist and nurseryman, as well as the seedsman, spring into activity; it is the catalogue which sets the pace for them, and were it suddenly to be withdrawn from circulation, many of those who abuse it would either have to take up the burden or cease business. The development of the catalogue has been wonderful in the extreme. Twenty-five years ago the most ambitious in the country was a book of about one hundred pages, six by nine inches, in a plain cover and sparsely illustrated. That was a tremendous advance over what was published ten years before. Today the leading catalogue has one hundred and ninety-four pages, is a book eight and a half by ten and a half inches, has an illuminated cover, six colored plates, colored photographic scenes, every page is profusely illustrated, and ten copies are distributed for one sent out twenty-five years ago. Although I am unable to say positively how many firms issued catalogues twenty-five years ago yet I think one hundred would cover them. Today there are about three hundred and fifty in the field. In addition to these we must consider the great number of foreign catalogues sent here; the American trade is no mean item to European houses. Owing to the great variety of stock carried by seedsmen, florists, and nurserymen, advertising must take the forms of securing distribution for the catalogue; they are all glad to send it to a bona fide buyer but must discriminate against the catalogue collector. Some still mail it free to applicants. Very ingenious are the plans adopted to secure distribution. The first I believe to advertise a specialty as a vehicle to distribute the catalogue was Peter Henderson with the celebrated Moonflower in 1887. To show the value of special adver-

tising well done there is no better illustration than this. He first offered the plant in his catalogue as *Calonyction grandiflorum* or "Evening Glory" in 1879, the text dilating on its "moonlike" flowers. In 1884 the name Moon Flower was used in the catalogue for the first time; the price was twenty cents each, then and up to 1887. When it was advertised in the magazines the price was fixed at forty cents each, and the demand was phenomenal, about sixty thousand plants being sold as against two thousand the previous year. This experiment showed so forcibly the value of a popular and descriptive name and the use of a specialty that the plan was followed by many thereafter with varying success. The use of the appellation "Ostrich Plume Chrysanthemum" for Mrs. Alpheus Hardy, and of "The Memorial Rose" for *Rosa Wichuraiana* were equally productive of results. In fact the effect of the latter was more far-reaching as it directed attention to the rose in such a manner that the raising of hybrids was stimulated in a great degree. The name of "Wineberry" for *Rubus phoenicolasius* was a palpable hit. But many overshot the mark, and some of the alleged popular names were not descriptive and were meaningless in their application. The Bush Lima Bean was another item which made a splendid specialty to advertise. The offering of a money prize for a suitable name was the natural outgrowth of the first principle, and for a time was a potent agent in attracting customers. All these are interesting as manifestations of the evolution in American horticulture. The catalogue trade in plants, influenced no doubt by the cut flower market, is given up largely now to roses, chrysanthemums, carnations, etc. Twenty-five years ago, there was a larger collection of plants offered than today. This is somewhat to be regretted. The greenhouses on large private places are mainly devoted to growing cut flowers instead of collections of stove and greenhouse plants. For this reason they are not so interesting to visitors, nor even to the owners, and a return to the former vogue would be an improvement.

The period which we are contemplating saw the rise, the climax, and the partial fall of the ornate bed, involved design, and carpet system of outdoor bedding. That it was carried to excess is undeniable. It is questionable taste to show prize fighters and

elephants in ornamental beds of plants. Butterflies could be tolerated; flags are not so bad; but ships that do not sail and railroad trains that never go, can only be regarded as monstrosities in lawn decorations. This school of gardening was vigorously attacked in the house of its friends by William McMillan at the Convention of the Society of American Florists in 1889. The temple of the cult was in Chicago and it is significant that at the World's Fair, in 1893, it was conspicuous by its absence. The pendulum swung too far the other way there, the reaction came; we are promised some ornamental bedding at the Pan-American in Buffalo this year. It will be welcome and will be a sort of poetic justice. My feeble voice was raised against the wholesale denunciation of ornamental bedding at the time and will continue to be raised. To do away with it would be a retrograde movement. The so-called "natural" system is not satisfying by itself, there is room for both in proper degree, for one is the complement of the other.

The grower for the retail stores is really a development of the quarter century. It is wonderful the quantity of palms, ferns, heaths, lilies, azaleas, hydrangeas, cyclamens, primulas, oranges, pandanuses, crotons, dracænas, poinsettias, and other flowering and decorative plants which are grown and sold now compared even with ten years ago. It is the finest development in horticulture. The market florist goes along in the even tenor of his way much as he did twenty-five years ago, only there is more of him. The same may be said of the country florist who grows for a home trade.

Now let us briefly inquire into the causes for the evolution we have been studying and view some of the effects produced thereby. First was the realization that the general florist could not produce first-class flowers; hence the specialist with all the improvements in structures and system. It is needless to go into the history of steam heating, large glass, improved ventilating apparatus, etc. This brought about better business methods; young men brought up in the country, accustomed to its ceaseless business activity, untrammelled by old-fashioned routine, got into the business; the older men were carried along by their example and helped them with their experience. The Society of American

Florists, founded in 1885, brought about a concentration of effort otherwise impracticable, if not impossible. A trade press was established through which intelligence was disseminated. The annual meetings brought men together and ideas were exchanged, rivalry was fostered, ambition received a spur. The florists stood before the country as a body of business men, they entered the legislative halls, they negotiated with transportation companies; in fact, they were metamorphosed as compared with the slow-going, plodding, happy-go-lucky men of a few years before. The great horticultural societies, those of Massachusetts and Pennsylvania, awoke to the growing importance of flowers and florists and increased the schedules of prizes at their exhibitions. The Department of Agriculture and the State Experiment Stations awoke too and listened to the calls from the florists; science was invoked and instead of the rule of thumb the laws of cause and effect came into play. The retail florist in the city became an artist; he rivalled the drygoods man in window display, he surpassed most of them in shop appointments. He transcended him and every one else in rolling stock. He dropped his first name on his signs and cards and became "The Florist" with a note of exultation in the title. The commission dealer created himself and has grown apace, a shrewd, energetic hail-fellow-well-met for the most part. The grower wrestling with the problem as old as business — From producer to consumer,— has formed his exchange, has become commission man himself and it is all part of the evolution.

Florists' clubs are in all the large cities; emulating their example, gardeners' associations have sprung up, organization is in the air and 'tis well 'tis so when rightfully conducted. We have the Rose Society, and the Dahlia Society, the Florists' Hail Association, the Florists' Protective Association. New plants are officially registered; printed labels are in general use in the shipping trade; we have wire stakes instead of split shingle; the hotels and private residences are bowers of exotic plants; one may order in New York to have flowers delivered in Paris, London, or Berlin; the florist has hitched on to natural gas for fuel; the great millionaires — some of them — have bestowed conservatories and parks on city and village; they have built great

ranges of glass for their own use; the florist is no stranger to cold storage and summer and winter look alike to him. These are a few of the mile stones in a quarter century's progress. In that period we have seen introduced the Bermuda Lily, the Crozy Cannas and their seedlings; we have seen roses propagated during summer and distributed by millions and tens of millions by mail and express; we have seen the home grower successfully compete in budded roses with the foreigner; cheap and good land with energy plus have beaten cheap labor; we have had *Asparagus plumosus* and *A. Sprengerii*; we have had the great Crimson Rambler Rose; we have seen the Bay Trees dot our streets; we have seen great botanic gardens, like the Bronx, brought into being; we have seen the wonderful development of the Arnold Arboretum and the Metropolitan system of parks in Boston; have seen the Back Bay Fens converted from a swamp into a garden; and here I desire to say that in all which tends to the advancement of horticulture along its best and broadest lines, the Massachusetts Horticultural Society has played and is playing a most prominent part. The "Boston" Fern has impressed itself on the horticulture of the day. Begonia Gloire de Lorraine has appeared, and this reminds me of how much we owe to Lemoine, Bruant, and other foreign hybridizers for improved heliotropes, syringas, begonias, fuchsias, pelargoniums (geraniums), chrysanthemums, roses, etc. There are other plants which signalize the quarter century, but I feel that I have named enough to show the progress made. It was my intention to devote some time to the advancement in small fruits but I understand that the subject has been covered by another.

The literature of the day and period must not pass unnoticed. We have the trade press already alluded to, "How to Grow Cut Flowers," an excellent book, Scott's "Manual," full of practical knowledge; we have the new editions of Peter Henderson's earlier works and his "Handbook of Plants." The Violet has been treated in a volume by Galloway, Mushrooms in another volume by Falconer, Sweet Peas have been treated by Hutchins, Dahlias by Peacock, Chrysanthemums by Morton, Barker, and others, Greenhouse Construction by Taft, besides other literature on horticulture. We are now receiving that comprehensive work

"The Cyclopedia of American Horticulture" by Bailey, to whom we are indebted for so much already. The Experiment Stations have sent out numerous reports on various matters so that the literature of horticulture has kept pace with its practical development. The only regret is that the amateur horticultural journals do not seem to attain the circulation and importance which should be theirs under such general prosperous conditions, but that will come in due time.

It only remains to observe in closing that the quarter century recently finished, and which rounded out the greatest century in material progress which the inhabitants of this planet had ever passed to their credit, is shown, I trust, to be a period rich in achievement for the horticulturist, particularly full of advanced progress, of concrete thought, of practical development for the floriculturist. The utilitarian branches have also advanced; but their greatest progress may well be credited to the preceding quarter century. The æsthetic branch, building on the others, as the airy minarets and graceful arches spring from and rest upon solid foundations and well buttressed walls, has grown full and fair and may well be taken as the fairest gauge of the nation's advancement along the lines of a higher civilization. As we stand on the threshold of a new century full of hopes and aspirations for still greater achievements, it is perhaps well that we should thus pause for a brief period, to beat time as it were in the march of progress, to take a breathing spell, to scan the achievements of the recent past and thereby perchance acquire new vigor for the work before us, or mayhap derive inspiration as we contemplate the great work done in this day and generation. While the commercial florist and horticulturist, as well as the private gardener, are justly entitled to their meed of praise for the part they played in the general advancement, too much cannot be said in laudation of the work of the men connected with the various Experiment Stations. A writer in the Agricultural Epitomist has aptly said: "In this utilitarian age, we are prone to measure success by dollars accumulated, by achievements upon battle fields, or in other tangible spheres, forgetting that back of the most worthy achievements there is science, and that science was likely discovered by some one who loved truth and his fellow man more than he loved himself

or money. The great army that is delving into the rocks, peering into the sea, reading the heavens, studying the plant, the fowl, the insect, conquering the elements and training them into subserviency to man, translating the language of nature, and flooding darkness with light, is unremunerated except by the satisfaction which the knowledge gives, and the world reaps the benefit."

Discussion.

Jackson T. Dawson said that the lecturer had only reiterated what every one present had seen of the beginning and progress of the traffic in flowers. In 1861 or '62 Hovey & Co. took their flowers to market in a basket. Smith of Cambridge did the same; he used to come to Hovey's nurseries and buy what he had not got. Crosses and other emblems were made in frames of willow or cut out of shingles. Not more than three hundred carnations were grown by any one. Lamarque was the favorite rose. New Holland plants were largely grown. Verbenas, which were then largely grown, have now gone out. *Epacris paludosa*, which has also gone out, ought to be revived. The number of greenhouses then could be counted on your fingers. A drug store on the opposite side of Tremont Street, was one of the largest places for the sale of floral decorations.

E. O. Orpet enquired as to the origin of the carnation Prosperity.

The lecturer replied that he could not give the parentage. It is not equal to Mrs. Thomas Lawson. Growers get them from three and one-half to three and three-quarters inches in diameter.

Thomas Harrison doubted the advantage of such extremely large flowers.

The lecturer thought we could not have too much of a good thing. Carnations will never be put with cauliflowers. We cannot get so many large ones as of smaller sizes. Growers like to get large flowers.

Willlam C. Strong said that he is now out of the line, but he had listened with exceeding pleasure to the lecturer. His last experience was with *Asparagus plumosus*.

William H. Elliott said there was once a great rage for dahlias; afterwards they went out and were scarcely seen. Now they are coming into fashion again.

The speaker moved a vote of thanks to Mr. O'Mara for his very excellent address, which motion was carried unanimously.

Mr. Orpet enquired of the lecturer what he esteemed the best decorative plant.

Mr. O'Mara replied that the question was a poser, but on the whole he should say Kentia.

He spoke of the development of floriculture at Natick as a revelation in its way, and perhaps the best organization.

At Chicago you can see from the top of the water tower a million square feet of glass devoted to the growth of flowers. The owners were originally market gardeners. At Hinsdale one man, not a florist but a business man, has six hundred and fifty thousand square feet of glass, on the ridge and furrow system.

Edmund M. Wood spoke of the environment of greenhouses. As ordinarily spaced in a house twenty feet wide, the first bed will produce forty per cent more than the second; the first bed shades the other. Ridge and furrow roofs shade one another; if the houses are twenty feet apart they do not.

In development we owe much to disbudding roses; the same treatment was afterwards applied to chrysanthemums. The florists said it would ruin their business, but it proved their salvation.

Mr. Harrison asked whether carnations require any particular soil. Those from other places are of little value when they get here.

The lecturer replied that he was not a carnation specialist, but they require a friable soil well enriched. Formerly it was believed that there was a "carnation belt," where they would succeed much better than outside of it; now it is known that they can be grown anywhere. Once it was thought that they could not be grown at an elevation of more than two thousand feet, but at Denver, at an elevation of six thousand feet, where they have three hundred sunny days out of three hundred and sixty-five, they grow better than at the seashore.

BUSINESS MEETING.

SATURDAY, March 2, 1901.

An adjourned meeting of the Society was holden at eleven o'clock today, the President, O. B. HADWEN, in the chair.

Ex-President William C. Strong reported that the Boston Co-operative Flower Growers' Association thanked the Society for the offer of one of its Halls for the Annual Carnation Show of the Association, but deemed it best to hold the exhibition in their own room.

The Secretary read a letter from Charles E. Cotting, presenting to the Society, in behalf of the Trustees of the Paddock Building, agreeably to the wish expressed by the Society, the two marble tablets in the staircase hall of the present Horticultural Building. It was voted that the thanks of the Society be presented to the givers for this kind act.

The Committee on Publication were authorized to print the Treasurer's Report as soon as it shall have been approved by the Finance Committee.

It was voted that the Building Committee be instructed to take charge of the removal of the statutes on the building, and the tablets in the staircase hall, before the expiration of the Society's lease of the Building, and report their action to the Society.

It was voted that the Library Committee be authorized to remove the library and library furniture to the new building, and that the Superintendent of the Building have charge of the removal of all other property of the Society.

It was voted that when any report deemed too long to be read in full is presented by either of the Standing Committees of the Society, the Chairman be requested to make a condensed statement of the salient points.

The decease of Edwin C. Lewis was announced, and Warren Howard Heustis, Patrick Norton and Joseph H. Woodford were appointed a Committee to prepare memorial resolutions.

The decease of Augustus Parker was announced by Ex-President William H. Spooner and it was voted that a Committee of three be appointed by the Chair to prepare a memorial of him. The Chair said that he would announce the Committee at the next meeting.

The Secretary announced the decease, on the 5th of December, 1900, of H. W. S. Cleveland of Chicago, Ill., and said that as a landscape gardener he was one of the foremost men in the country. He was associated with Robert Morris Copeland, and afterwards, at Prospect Park, Brooklyn, N. Y., with Frederick Law Olmsted. He had charge of many important works, among them being parks in Providence, R. I., Chicago, Ill., Brunswick, Ga., St. Paul and Minneapolis, Minn., Omaha, Neb., Sleepy Hollow Cemetery, Concord, Mass., and the grounds about the Natural Bridge, Va. His book on "Landscape Architecture as applied to the wants of the West" and several addresses on parks and kindred subjects were presented by him to our Library. At one time he engaged in the culture of fruit at Burlington, N. J., and was for twelve years Corresponding Secretary of the New Jersey Horticultural Society. During this period he attended the first meeting of the American Pomological Society. He was elected an Honorary Member of this Society in 1848.

It was voted that the Secretary express to the family of Mr. Cleveland the esteem and respect in which he was held, and that the same action be taken in regard to Mr. John Galvin, who died on the 24th of February.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were upon ballot duly elected:

MRS. CHARLES T. WHITE, of Boston,
HARRY E. FISKE, of Wollaston,
CHARLES A. STONE, of Newton.

The meeting was then dissolved.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, March 9, 1901.

A meeting for Lecture and Discussion was holden today at eleven o'clock, the President, O. B. HADWEN, in the chair.

The following lecture was delivered:

FRUIT GROWING IN NEW ENGLAND AND ITS DEVELOPMENT DURING THE LAST FIFTY YEARS.

By HON. AARON LOW, Hingham.

If we go back fifty years we find that the culture of the various kinds of fruit adapted to our New England climate was in small amount as compared with the great importance in our productive industries that it holds at the present time. Then there was but a very small amount of grafted fruit, of the varieties which now are in great demand, and which are produced in immense quantities.

APPLES.

The apples then were produced mostly from orchards of natural fruit, as but few of our first-class apples of the present time were much disseminated then; in fact many were not then known.

There is no doubt that the apple stands first in commercial importance as being more largely cultivated than any other species of fruit. Scarcely a farm can be found in New England but has its apple orchards, and the products have ever been considered as the most profitable of the farm. Within fifty years there have been many new varieties of apples introduced, so that now in setting out an orchard we have a much larger number of choice varieties to select from than formerly.

There is no other variety as largely cultivated in New England as the *Baldwin*. It is well adapted to our climate, as it was originated in Massachusetts; is of strong, vigorous growth, an immense bearer of large, handsome red apples, and stands ahead of every other variety as a salable winter apple. The quality is first class for eating or cooking. I think there are more trees of this apple set out than of all others in New England.

Another first class apple well adapted to our climate is the *Rhode Island Greening*. This is a large green apple of excellent quality. Tree of strong vigorous growth, producing large crops of fine handsome fruit, fine grained, and of rich acid flavor. This I think stands next to the Baldwin as a profitable variety for orchard culture.

As one of the best winter keepers the *Roxbury Russet* is valued very highly. Twenty-five years ago this was much more profitable to grow than it is at present. Within a few years it has developed a tendency to mildew the fruit, and the apples do not grow as large and fair as formerly. Under present conditions it is not advisable to set out many trees of this variety.

The *Porter* and *Hubbardston Nonsuch* years ago were two of our best and most profitable fall apples, but for a number of years past a small worm has done a great deal of damage to the fruit of these two varieties as well as most varieties of sweet apples. It is called the Apple Maggot. Its method is to tunnel through the pulp of the apple in winding channels, thus rendering it worthless.

Without doubt the most destructive insect to our fruit is the Codlin Moth. According to Professor Slingerland the damage caused to the fruit crop by this insect alone amounts to many millions of dollars yearly. In 1892 this insect is said to have caused a loss of $2,000,000 to the apple growers in the single state of Nebraska. In the state of New York it is estimated that the damage to the apple crop yearly is $2,500,000, and the damage to other fruit enough to bring the total loss up to $3,000,000, or, in other words, the fruit growers of New York furnished this amount yearly to feed this destructive little insect.

The rapid multiplication of destructive insects has made it a necessity to the fruit grower to adopt such means as are most effective in checking their injuries to the fruit in the first stages of its growth, or immediately after the fall of the blossom. There is no more effective method that we can employ than to spray our fruit with the various insecticides as per the formulas of our Experiment Stations.

As an early variety, the *Williams* ranks very high. It originated in Roxbury. On rich strong land and given high cultivation

this is always a first class apple. Of good size, bright, handsome red color, mild and agreeable flavor, this is one of the most salable apples known, and usually brings large profits.

Red Astrachan is one of the earliest varieties. This is a very handsome apple, brilliant crimson color with a thick bloom, flesh acid, and of marked excellence in cooking. Tree a strong vigorous grower, and very productive. Fruit should be picked a few days before it is ripe, as it does not keep well if allowed to become fully ripe on the tree.

Duchess of Oldenburg. This apple is of Russian origin. Large, very handsome, streaked with red and yellow. Flesh yellowish white, sub-acid, excellent for cooking. Tree very hardy, a strong grower, an early and abundant bearer.

One of the most desirable of our fall apples is that superb variety, the *Gravenstein.* This is a large, handsome, striped apple, of the highest flavor and quality, and usually commands the highest prices. On strong, rich land it is one of the most profitable apples grown.

Many people prize a good sweet apple very highly. There is no better variety as an early sweeting than *Sweet Bough.* Fruit large, greenish yellow, very tender and sweet.

As a later sweeting for use from November to March, the *Jacob's Sweet* is a first class apple. Large to very large, yellow, splashed with red. Excellent to eat or bake.

King of Tompkins County is one of our largest and most showy red apples. Tree a strong grower and a good bearer. Fruit deep red; flesh tender, juicy and high flavored. Keeps through the winter. One of the best.

Fameuse or *Snow Apple.* This variety when well grown is one of the handsomest apples known, and usually sells at high prices. Of late years it has been inclined to mildew and this detracts from its value. Medium in size, deep red on a whitish ground; flesh very white, juicy, with an exceedingly pleasant spicy flavor.

Golden Russet. This is an old variety, but of such rich, spicy flavor that it is a universal favorite. Fruit medium size; skin of a decided yellow russet color, flesh tender, juicy and rich. Tree a vigorous grower and very productive.

There have been within a few years past quite a number of new varieties of apples introduced combining many desirable qualities as first class fruit, and originating in our own country. As one of the most promising of these new varieties *Sutton Beauty* ranks high. This is a good sized, handsome, reddish apple, of first class quality for the table or for cooking. Tree an exceptionally fine grower and of handsome shape; foliage bright, glossy green, and always healthy. A regular bearer of choice apples of fine quality.

McIntosh Red. This originated in Canada and is an exceedingly valuable kind. The fruit is dark red; flesh white, tender, juicy and of rich flavor. A regular bearer, resembling the Snow apple but of larger size and more hardy and not subject to mildew. It is a very desirable variety for orchard culture.

Wealthy. This apple originated in Minnesota. The tree seems to be perfectly hardy, and has given excellent satisfaction whenever it has been fruited. The fruit is of medium size, bright red streaked with white. Flesh white and of fine quality. Tree strong and healthy, one of the best for orchard setting.

Palmer Greening. This variety is not much disseminated but is one of the best in quality. The tree is not a very vigorous grower, and is said to be better when top-worked on strong growing varieties. The fruit is yellowish green, and of a peculiar rich aromatic flavor. A very good keeper and a very promising variety.

Wolf River. Originated in Wisconsin. The fruit is very large and handsome. Specimens of this variety at last fall's fruit exhibitions attracted more attention than any other. Fruit bright red, flesh white and of fine quality.

Pears.

The pear when grown in its full perfection is highly esteemed for its rich, sweet, and delicious flavor. As this is adapted to closer planting than the apple it is usually set in the home garden, as a greater variety of fruit can be had. Some of the best varieties of pears seem to do better when set as dwarfs grafted on the quince; in that case the trees can be set from ten to twelve feet apart. My experience has been that far better specimens can be grown on dwarfs than on the standard trees.

Angoulême, Louise Bonne of Jersey, Anjou, Vicar and Clairgeau are varieties much improved in the quality of the fruit when grown as dwarfs. Of the varieties more commonly grown Bartlett, Bosc, Sheldon, Seckel, Winter Nelis, Clapp's Favorite and Lawrence do best as standards.

As a variety adapted to almost all localities the *Bartlett* stands first. Fruit of large size, clear yellow, flesh fine grained, exceedingly tender and buttery and rich flavored. Tree a good grower, comes into bearing young, and is very productive.

Clapp's Favorite as a summer pear is a very fine variety when picked before fully ripe. Fruit of good size; flesh melting, juicy and sweet but sometimes inclined to rot at the core. Tree vigorous and healthy.

When we consider the highest standard of quality in richness and flavor the little *Seckel* stands at the front. Although it is one of the smallest pears we have, from its exceeding sweetness and unequaled rich flavor no collection is complete without it.

Dana's Hovey. This is also a small pear, but from its rich and delicious flavor is very highly esteemed. The tree is a very handsome grower and is very productive; fruit keeps till winter.

As one of the largest pears of high quality grown, the *Angouleme* will give as good returns to the grower as any, especially when grown on dwarfs. The fruit is very large, of fine appearance, always commanding a ready sale.

Louise Bonne of Jersey is another variety that does best on quince. This is a large sized, longish pear, greenish in color with reddish shading on the sunny side. Flesh very juicy and melting with pleasant sub-acid flavor. Tree a good grower and productive. This variety when well grown is very profitable.

Anjou. This pear, introduced many years ago by that veteran pomologist, Hon. Marshall P. Wilder, is one of the most valuable grown. Its reliability, uniform good quality, and long keeping, render it one of the most profitable varieties in cultivation. Fruit large, fine grained, with a rich vinous flavor. It does exceedingly well on the quince.

Clairgeau. This is one of the largest and handsomest pears in cultivation, also one of the best to grow on the quince. The fruit is yellow and red, and although not of the best quality is, from its

large size and handsome appearance, very salable. Tree a good strong grower and an early and abundant bearer. A valuable variety.

Lawrence. One of our best winter varieties. Fruit medium in size; flesh buttery, juicy and very sweet. Tree a moderate grower, but very productive.

Bosc. Truly a magnificent pear. There is no other pear combining as many first class qualities as this. The fruit is large, always perfect, and of the highest flavor, is distinct in form, of a deep yellow russet color. The flesh is white, juicy, with a rich delicious perfume. It sets its fruit singly scattered over the tree, as if it had been thinned, thus producing fine handsome pears. The tree is a good bearer but not a vigorous grower and does better when top worked on such strong growing varieties as Keiffer and Vicar.

Vermont Beauty. This is a handsome, medium sized, yellow pear with a bright carmine cheek. The flesh is rich, juicy, and aromatic, resembling the Seckel, which variety it immediately follows in ripening.

Worden-Seckel. This is a new variety, originated in New York. Fruit of medium size, flesh fine grained, juicy, and of excellent quality. Very promising.

Hardy. This is a large russet pear. Tree a strong grower and abundant bearer of handsome smooth fruit, with rich, slightly sub-acid flavor. It ripens in October. Very desirable.

Boussock. A large roundish pear, yellow when ripe, with a slight reddish cheek. Tree a vigorous grower and good bearer. Ripens the middle of September. A valuable and reliable pear.

PLUMS.

The cultivation of the plum has largely increased within the last ten years. The old varieties became so subject to the disease of the black-knot, that the trees soon died and it was almost impossible to raise a full crop of plums.

The introduction of the Japanese varieties created a new interest in growing plums. The trees proved to be not subject to the black-knot, neither were the small plums injured by the curculio nearly as much as the European or American varieties. Since

their introduction the better varieties of the Japanese plums have been largely set out. The trees are well adapted to our soil and climate, and appear to be less subject to disease than the old class of plums. There are quite a number of varieties of Japanese plums much superior to our old American or European kinds in quality of the fruit as well as in the vigor and healthiness of the trees. I will briefly notice some of the better kinds, with the principal points in favor of each.

Abundance. This was one of the first introduced, and is a first class variety in every respect. Tree a strong upright grower, coming into bearing very young. It is extremely productive of large handsome plums, of a bright cherry color with a heavy bloom. Flesh orange yellow and of a sweet, rich, sprightly flavor. Decidedly a great acquisition.

Burbank. With many this is reckoned as the best variety of the Japanese plums. The trees are very strong growers, inclining to spread their branches irregularly and coming into bearing very quickly. It usually sets the fruit very thickly and it is much better to thin the plums out severely, as those left will make much larger and handsomer specimens. The fruit is dark red to bright amber in color, roundish in shape and of good size. Flesh amber yellow, juicy with rich sugary flavor. If you have a place for but a single tree set the Burbank.

Wickson. This variety was originated by Mr. Burbank of California, and was obtained by crossing the Kelsey plum with Burbank, and is considered by him the best of the Japan plums. The tree is an upright, very strong grower. Fruit medium in size, glowing carmine with heavy white bloom. Flesh yellow, spicy, sub-acid, good. I have not fruited this variety as my trees are but two years set, but they are now covered with blossom buds for the next year. This has not been as thoroughly tested as Abundance and Burbank, but those who have fruited it speak very highly of it.

Satsuma. Another Japanese variety, but different from all the others, having a bright red flesh; is much prized for making jellies or preserving.

Hale. This was recently introduced, and although not fully tested is considered very promising. Fruit large, bright orange, mottled with cherry red and of extra fine quality.

Although many of the European and American varieties of plums are subject to the black-knot, still they are such strong, vigorous growers, and so exceedingly productive in fruit, that some of them are well worth risking to set in our plum orchards. When well taken care of, and the black-knot at its first appearance carefully cut out and burned, the trees will give heavy crops of very choice plums.

Bradshaw. This is one of the best; a very large dark purple plum; flesh brownish purple, juicy and of good quality. Tree a strong vigorous grower, setting its fruit well over the tree, and does not need thinning as much as some other kinds. Ripens the last of August.

Lombard. This is a variety of American origin, and taking all of its good points I think stands highest in the entire list of European or American varieties. The tree is a good grower, and immensely productive of plums of good size and very good quality. This variety usually sets its fruit so thick that it should be severely thinned to have the fruit grow to a good size and mature well; besides, the plums are not as liable to rot as when growing thick.

Pond's Seedling. This is of English origin and truly a magnificent variety. The fruit is large, reddish violet in color, juicy, and of fine quality. Tree vigorous in growth and an abundant bearer.

Smith's Orleans. This is a wonderfully productive variety. Fruit large, reddish purple; flesh firm, juicy, with a rich vinous flavor. The trees do well in all soils. An American plum, originated on Long Island.

Lawrence. This is also of American origin. Tree thrifty and productive. Fruit yellowish green with a light bluish bloom. Flesh melting and rich flavored. An excellent variety.

Peaches.

Peaches when well grown are the most delicious of all of our fruits. But as the trees are very tender and with difficulty withstand our changes of climate, success in growing first class fruit is quite uncertain.

One of the most serious troubles in peach culture is the late frosts in the spring. If it is mild and warm in early spring and the peach buds start to grow, and then follow late frosts, the blossoms are often ruined and the crop is lost. The trees should not

be forced to make too large a growth, as a moderate growth ripens better and makes a harder, firmer wood, not as liable to injury from cold.

Among the great number of varieties now cultivated, the more choice kinds should be selected, and if well cared for we may get a good crop of this delicious fruit.

The peach is a rapid growing tree and comes into bearing at an early age. The trees do best on light warm land and should not be fertilized with stable manure, but with wood ashes, bone dust, and nitrate of soda, as this combination gives a more hardy and stouter growth, and a better development of fruit buds.

Among the many choice kinds I will select such as seem best adapted to our locality.

Early Canada. This is one of the very earliest, of good size, fine quality and fine appearance.

Early Crawford. A magnificent large yellow peach of excellent quality. Tree vigorous and productive. One of the best.

Coolidge's Favorite. A large white peach with crimson cheek. Flesh juicy, sweet and of rich flavor. Ripens about the middle of August. Very desirable.

Crosby. This is said to be the hardiest of all peaches to withstand our cold winters. Fruit bright orange yellow, sweet and of good flavor. Tree vigorous and healthy. An excellent variety for orchard culture.

Elberta. A large yellow peach of recent introduction. Tree vigorous, strong grower. Fruit oval, yellow, with blush on sunny side. Flesh pale yellow, tender and juicy. One of the most desirable of the new varieties.

Foster. Very large, deep orange red. Flesh yellow, very rich and juicy and of excellent flavor. Ripens in September. Originated in Medford.

Globe. A new variety. Strong and vigorous in growth and an enormous bearer. Fruit very large, yellow shaded with crimson. Flesh very rich and luscious. Should be in every collection. Ripe in September and October.

Carman. A new peach, originated by Mr. Carman, Editor of the Rural New-Yorker. This has not been cultivated long enough to determine its full value, but it is very highly recommended.

Fruit of large size, yellow, shaded with red; flesh juicy and of fine flavor.

Oldmixon. An old variety, but one of great value. Succeeds in almost all localities. Fruit large, yellowish white with a deep red cheek. Flesh red at the stone, tender and excellent.

Stump. A first-class variety. Fruit large; flesh white, very juicy with an excellent flavor; parts freely from the stone. Ripens in September.

Late Crawford. This is the standard late peach. Fruit of large size, greenish yellow, with dull red cheek. Flesh red at the stone, of rich, juicy, vinous flavor. Ripens the last of September.

Grapes.

Grapes can be grown so easily by any one who has but a small extent of land, training the vines on a wall, on a trellis, on the side of a building facing south, or to single stakes, that it is almost in every ones power to grow a few varieties at least for their own use. Light warm soil, well drained, is desirable, as the grapes will mature and ripen sooner than on soil not well drained. Wood ashes and fine ground bone are special fertilizers for the grape, as they will cause the vine to grow shorter jointed wood which will ripen better than long jointed wood. From the great number of varieties in cultivation, a selection of a dozen kinds will give one a good variety of the different colored grapes.

Campbell's Early. This is a very early grape of recent introduction, and wherever tried it is spoken of in the highest terms. It is earlier than the Concord, has a larger bunch than that first class grape and as a long keeper after being fully ripe is unequaled by any known variety. A black grape with very handsome bunch and berry. Ripens in September. Flesh very tender and juicy; flavor sweet, rich, aromatic; quality best.

Green Mountain. This grape was introduced a few years ago by Stephen Hoyt & Sons, New Canaan, Ct. The bunch is of good size; berries medium, greenish white in color; skin thin; pulp tender and sweet. Very early, always fully ripe in August. Vine vigorous and healthy, yielding heavy crops of fine grapes. A very desirable variety.

Eaton. This is one of the largest grapes in cultivation, both in bunch and berry. Vine vigorous, healthy and productive. The grapes have a tender pulp, and are juicy and of fine flavor.

Moore's Early. This is one of the earliest of the black grapes. Originated in Concord, Mass., by John B. Moore. This grape has been largely set in vineyards, in the grape growing localities, and is very highly esteemed as a reliable, profitable variety. Color black, with a heavy blue bloom. Ripens from two to three weeks before the Concord. Quality excellent. A first class variety.

Worden. A large new variety, a seedling of the Concord. Bunch and berry large size; color black with bluish bloom; fruit sweet and of fine quality. Ripens from one to two weeks before the Concord. No early black grape stands higher than this.

Brighton. A reddish grape of the highest quality, bunch and berry of good size; vine vigorous and productive. Fruit roundish, dark maroon color, flesh tender and juicy with a peculiar aromatic flavor. One of the best varieties for the home garden.

Moore's Diamond. A first class white grape. Bunch compact and shouldered. Berries large, round, juicy, with but little pulp. Vine a good grower, with thick healthy foliage, hardy and productive. Ripens a little before the Concord. Very promising.

Pocklington. Originated in the state of New York. Vine a very strong vigorous grower, hardy and productive. Bunch and berry of good size, color a lemon yellow. Flesh sweet, with a rich aromatic flavor. Has given good satisfaction to all who have grown it.

Delaware. The standard of quality. Bunch rather small; berries medium. The flesh has an exceedingly rich, spicy flavor. Vine not a strong grower; foliage apt to mildew.

Concord. Without any question this old and well known variety, as a reliable and profitable grape, stands at the head of the list. Adapted to a larger extent of our country than any other, it has been more universally grown than all others combined. Not of the highest quality in its fruit, still it combines so many desirable qualities that it is essentially the grape for the home garden. Bunches large and handsome; berries black with a heavy blue bloom. Flesh juicy and refreshing.

Salem. This is regarded by many as the best of the Rogers Hybrids. The vine is a strong grower, producing large bunches of reddish grapes, with a very sweet and rich flavor resembling that of foreign grapes. An excellent variety.

McPike. This new and wonderful grape is of western origin and is introduced by a western firm. It seems to have astonished all who have seen it on the grounds of its originator, not only in the size of its bunch and berry, but also in its wonderful vigor and the healthiness of its foliage as well as in the tenderness and delicious flavor of its fruit. Bunch and berry said to be fifty per cent larger than the Worden. Flesh ripens to the core, and is of excellent flavor, resembling the Black Hamburg. Wherever it has been exhibited at various State fairs in the west it has taken all first premiums. Another very important point in its favor is its long keeping quality after being fully ripe. The highest authorities in horticulture speak of it as a grape of wonderful qualities and promise.

Small Fruits.

The advancement of the culture of the small fruits in the last fifty years has been phenomenal. Previous to the introduction of the Hovey's Seedling strawberry, by the Messrs. Hovey of Cambridge, in 1836, the varieties of strawberries cultivated were few in number and inferior in size and productiveness as compared with the large number of choice varieties now cultivated.

The originating and introduction of the Hovey's Seedling was a marked advance in the culture of the strawberry. This new variety was a large handsome berry, deep shining red in color, flesh firm and of excellent quality. It was a pistillate variety and was usually set in beds with every third row of the Boston Pine, a staminate variety, to insure perfect fertilization of the Hovey's Seedling blossoms. When fully fertilized it was immensely productive of large first class fruit.

Since the introduction of Hovey's Seedling, strawberry culture has extended over the greater part of the country. Many new kinds of high merit in quality and productiveness have been introduced.

Since the close of the civil war the culture of strawberries has largely developed in the southern states and our markets now are supplied with this luscious fruit several months in the year.

Many of the new varieties are perfect in blossom and are grown without any other varieties being set with them.

The strawberry is of such easy culture that every home garden should have its plot for family use. Among the great number of varieties I will name a half dozen of the best—Belmont, Marshall, William Belt, Nick Ohmer, Beverly and Sample.

As following the strawberry, raspberries are highly prized for family use. Of the red varieties Cuthbert and Loudon are most desirable, and of the Blackcaps, Cumberland and Gregg are hardy, productive, and of fine quality.

Following in succession come the better varieties of blackberries — Snyder, Erie, Eldorado and Rathburn, first class kinds, producing large crops of berries of excellent quality.

Of that old and well known fruit, the currant, Fay's Prolific, Versaillaise, Victoria, and Pomona as new varieties are improvements on the old kinds of fifty years ago.

The gooseberry in some sections is largely grown. The better varieties now in cultivation, Josselyn, Smith's Improved, Industry, Triumph, and Columbus rank very high, and are not as subject to mildew as many of the older kinds. In the foregoing paper I have endeavored to name varieties in the different classes, which are best adapted to our soil and climate, as demonstrated by many years of cultivation in the different sections of New England. To those not well acquainted with the many varieties of fruits, these lists will, I trust, be a guide in selecting kinds which will be satisfactory in their future experience.

The details of setting out and after treatment I have omitted for the purpose of calling out by questions from the audience different methods and experiences on these points which although essential to know, differ greatly in application in a variety of soils and locations. I trust those present will freely question on any points which they desire to bring out.

Discussion.

Samuel H. Warren inquired as to the character and value of the Early Canada peach.

The lecturer replied that it resembles other very early peaches and like them will sometimes spot with rot.

Varnum Frost said that he could not agree with the lecturer in regard to some of the pears recommended by him. The Anjou has great failings; it is apt to be infected with spots of black fungus. Some have grafted their Anjou trees with Bartlett. The Keiffer pear is worthless.

The lecturer said that many peaches reproduce themselves from seed, the Melocoton, for instance. He had an orchard of Roxbury Russet and Baldwin apples which interlocked, and some of the limbs of the Baldwin trees showed a mixture of Russet, and some of the Russets showed the influence of the Baldwin pollen. The Keiffer pear is valuable to top graft with Bosc and other poor growing sorts. We should remember that kinds which do poorly with one may do well with another.

Mr. Frost said that the Hovey's Seedling strawberry used to grow with only the Boston Pine to fertilize it; there was nothing to surpass these two kinds. The Boston Pine was never beaten as regards flavor.

The lecturer spoke of a neighbor who raised fine Hovey's Seedlings and set out a bed for a friend which never bore.

E. W. Wood said that there had been no particular improvement in fruits in the last twenty-five years — not as much as in flowers. One man has done perhaps more than any other man in the country,—Luther Burbank. He originated the Burbank potato many years ago while residing at Worcester. Afterwards he went into the nursery business in California and devoted himself especially to originating new fruits. The speaker wished that we might have many more young men disposed to undertake the improvement of fruits. This can only be done by cross fertilization. We have none worth growing that were not grown twenty-five years ago. An Ex-President of this Society was about to set out an apple orchard of six hundred trees, and went to Mr. Curtis, one of the largest dealers in apples, to get his advice as to the best kinds to plant. It was solely a mercantile operation and Mr. Curtis advised him to set out five hundred Baldwins and the other hundred of different varieties, but on second thought he advised to plant all Baldwins. No other apple will return so many dollars

to the grower as the Baldwin. The speaker said that if he were a young man he would buy up land which can be got at a very low price and plant it with Baldwin apple trees.

Fifteen years ago no pear was so profitable as the Anjou, but within the last five years it has been failing. The Bosc is one of the best. The speaker esteems the Dana's Hovey the best pear grown; it requires thinning to get the fruit of good size. The Clairgeau would never be put into a list of pears for home use. It is purchased by hotel-keepers because it is as handsome as a bouquet and lasts tremendously.

There is scarcely a strawberry seen on our tables now that was grown fifteen years ago, and most of the kinds have been introduced within five years. We can get new varieties very quickly and there seems to be a prospect of continued improvement.

Great additions have been made to our fruits in the way of Japanese plums. Some have found them to rot even after thinning. At the Agricultural College the buds were reported to be as tender as those of peaches.

Market growers are very careful about planting blackberries or raspberries. There has been a great advance in transporting fruit within a few years, so that we now have strawberries in our market nine months in the year, and the quantity of fruit sold has doubled and tripled.

Samuel H. Warren said that fifteen years ago he set out a hundred Black Heart cherry trees, and last year he pulled up all but five and headed those back.

Mr. Frost said that he did not believe in apples mixing by cross-fertilizing; the Baldwin, Porter and Hubbardston are just the same as they were fifty years ago.

The lecturer said that the change produced by cross-fertilization is not in the fruit, but in the tree produced from the seed. The Marshall strawberry does not flourish everywhere. The conditions of fruit growing are very different now from what they were forty years ago.

John Ward said that he planted Hovey's Seedling strawberry with Early Virginia on one side, and for the first rod he got a good crop and beyond that none. The influence of the pollen of the Virginia did not extend beyond the first rod. There is no

better strawberry now for quality than the Hovey though some kinds are more productive. When he was a boy the St. Michael pear began to crack, and the Anjou is now becoming spotted and cracked, as may be seen by some in the market. The Bartlett seems to stand when others do not. There is no better pear than the Bosc. There is danger of overdoing the business of raising late pears; there is no demand for them after the first of December.

Joshua C. Stone asked, what is the use of setting out trees? Life is too short. People want green leaves more than they do fruit trees. There are as good apples and pears raised now as ever there were. He knows one man who has all kinds of fruits and has been forty years raising them, who is going to move away his seven thousand dollar house and put in a twenty thousand dollar house. The speaker dug up all the apple trees he had in good ground and has grafted over all his Baldwins and put in Williams and other new apples.

The lecturer said, in reference to Mr. Stone's remark that life is too short to justify planting trees,—Suppose you do not get a crop of fruit, somebody will come after you to get the benefit of your work. [Applause.]

Benjamin P. Ware said that the Essex Agricultural Society some years ago offered a premium of one hundred dollars for an apple as good or better than the Baldwin, but it has not yet been taken. He advised planting orchards in a hill town, and when the trees were just coming into bearing the owners got four or five dollars per barrel for the fruit in a year when apples were scarce. He asked whether Mr. Stone could make us believe that people are getting out of the way of eating fruit. When Luther Burbank wanted to go to California, where he is now a great originator of new fruits, J. J. H. Gregory paid him a hundred dollars for the Burbank potato, which set him up there. This variety is very popular through the west and in Europe.

Michael Sullivan had heard it said that the average market gardener has no respect for an apple tree, which may be true. Sixteen years ago he had no apple trees on his homestead, but twelve years after he had one of the finest crops of Baldwins. Last year he would have had a good crop but for the high wind in September, but he put fine apples into his cellar. Land is

getting too valuable for orchards in the vicinity of Boston, as at Revere.

William C. Strong said that a great many of the new plants cultivated by florists have been imported from abroad, but a much longer time is required in producing new varieties of tree fruits than of flowers.

Many years ago he bought the largest grapery in the country, and raised in it three tons of grapes annually which sold for from one to three dollars per pound; now we get them from California for twenty cents per pound. The apple is the fruit of Massachusetts. Messrs. Wilder and Hovey had two or three hundred varieties of pears, and could get six, eight or ten dollars per bushel for them, many varieties of which could not now be given away. He would not plant six hundred pear trees all Bartlett, though. We want to confine culture to a few varieties. He would discard Clairgeau and Keiffer; we want better kinds.

Mr. Wood said that florists here do not go abroad for new chrysanthemums; we have better varieties here than can be found in Europe.

Joseph H. Woodford said that we have the markets of the world and all the surplus fruit can be sold abroad. We can get better prices for fruit there than we can here. A young man can set out fruit trees and have a bank which in fifteen years will yield dividends. Though not a young man he means to set out a hundred trees this year. He thinks it every man's duty to set out fruit trees; somebody will come after us who will profit by them.

President Hadwen said that in 1842 he planted the seeds from which his apple orchards have grown, and when they attained a proper size he budded them in the nursery. Nature has never produced but one Baldwin, one Gravenstein, or one Rhode Island Greening apple. The Baldwin is the apple for the million, but the million do not know the best. Persons educated in a knowledge of the best varieties do not buy Baldwins. They are put up in carloads for wholesalers; his apples go to other parties. The Foundling is one of the best apples; it is a native of Worcester County.

The lecturer said that his father set out an apple orchard when about sixty-eight years old, and lived to sell hundreds of dollars worth of fruit from it.

Mr. Stone spoke of a man who bought ten thousand barrels of apples for a dollar a barrel and paid twenty-five cents apiece for barrels to put them in.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, March 16, 1901.

A meeting for Lecture and Discussion was holden today at eleven o'clock, the President, O. B. HADWEN, in the chair.

The following lecture was delivered on the John Lewis Russell foundation:

STUDIES OF SOME TREE-DESTROYING FUNGI.

By Professor GEORGE F. ATKINSON, Cornell University, Ithaca, N. Y.

When invited by your Committee to give the lecture this year on the John Lewis Russell foundation, I understood that the subject was to be in general, "Parasitic Fungi." It was but a week ago that I learned that the foundation for these lectures on parasitic fungi was made by Professor Russell for the purpose of presenting the "latest discoveries of the connection of the Fungi with Horticulture." It was then too late to think of changing the subject of this address to deal more particularly with the latest discoveries of fungi in relation to horticulture. But I trust that the subject I have chosen will be none the less acceptable. For while the studies which I am to present have been made chiefly on forest trees, some of the observations have also been made on fruit trees and shade trees. In a number of cases the same species of fungi are enemies both of fruit trees and forest trees, while the general problems of the entrance of the fungus and its progress in the tree are the same. The subject contributes very materially, if not directly, to the interest of horticulture.

The fungi of which I shall speak are sometimes called "wood-destroying fungi," because a number of them are known to infest timber and cause its decay. Few of them can enter a thoroughly sound tree — that is, they cannot from the outside gain an entrance unaided through the living layer of tissue, the cambium. The cambium envelops the entire tree, root and branch, and thus in an uninjured condition constitutes an effectual barrier against many of these tree enemies. For their entrance they are usually dependent upon other means than their own activities. These places of entrance are wounds from mechanical injuries due to a great variety of causes, wounds caused by truly parasitic fungi, and lesions caused by the natural process in shedding the lower limbs, when the process of healing over may be slow. For the reason, therefore, that quite a large number of the tree-destroying fungi enter through wounds, they have been called also "wound parasites."

I shall not attempt to review all the good work which has been done on the subject, but you probably recall the first address delivered on an occasion similar to this, by Dr. Farlow, on "Diseases of Trees likely to follow Mechanical Injuries." Mention should be made of the important work done by Professor Hartig in Germany on diseases of forest trees.

My own studies of this subject began about five years ago, and the results have been accumulating since that time, while very little of the matter has as yet been published. It has been my plan, as far as possible, to select one or more individual cases and then endeavor to trace the history of the relation of the fungus and its host. This would include a study of the present conditions, and an effort to determine, by examination, the time in the past when the fungus entered, the mode of its entrance and progress, as well as the probable cause of the wound which provided the entrance court for the tree enemy. In a number of cases these have been worked out quite satisfactorily. The studies have been made in New York State, chiefly at Ithaca and in the forests of the Adirondack Mountains.

Photographs have been made from time to time during the progress of the studies, and with the aid of them I hope to reveal the history of those cases to you.

A word might be said at the outset in regard to the relation of

these wood-destroying fungi to others, as well as in regard to their structure. They are among the higher fungi and belong to the larger group known as the *Hymenomycetes* to which the mushroom also belongs. In fact it is becoming customary with some to apply the term "mushroom" to all of the *Hymenomycetes*. However widely these plants differ in their form and structure they all agree in the general character of their fruiting surface. It forms a thin layer, or "membrane," covering definite parts of the fruit body, and consisting of innumerable club-shaped cells standing side by side. Each one of these club-shaped cells is called a *basidium*, and usually bears four spores.

There are several large families, or orders, in the group. I will call attention to a very few in each family in order to show more definitely the form and general character of the species which we will examine more carefully. In one of these families the fruit body is often spread over the surface of the wood in thin smooth patches, or some forms are shelving, when the underside is smooth and is the fruiting surface. These belong to the family *Thelephoraceæ*. A few of its members are very destructive to wood and some are parasites on trees. In another family the members are known as *coral fungi*, a large number of them belonging to the well known genus *Clavaria*, from which the family name *Clavariaceæ* is derived. The fruiting surface is distributed all over the surface of the plant. To a third family, *Hydnaceæ*, belong the hedgehog fungi, with the fruiting surface on spines, a few species of which are well known. A number of the members of the two last named families grow on wood, but often appear in late stages of decay. A few species like *Hydnum septentrionale* on maple, and *H. Schiedermayeri* on apple, are destructive.

The two largest families are known as the *Agaricaceæ*, to which the common mushroom belongs, as you well know, and the *Polyporaceæ*. In the latter family the fruiting surface is in the form of a honeycomb on the underside of the fruit body. It is to this last named family that the species belong of which I shall speak at some length.

Polyporus borealis.

Polyporus borealis occurs on pines, spruces, the hemlock, etc., and is widely distributed over the North Temperate Zone. It

occurs on living or dead trees, and is a "wound" parasite, entering through broken branches, through wounds caused by impact of falling timber, or where the cambium has been scorched by fire. The fruit bodies are entirely white. When old or dry they often take on a pale yellowish tinge. They are shelving, the cap attached directly to the tree, broad at the free end and tapering somewhat in a wedge-shaped manner toward the base. They are rarely single, and sometimes scattered over the trunk. They usually occur several close together overlapping in an imbricated fashion, and joined at the base in a common trunk at the exit from the tree.

The fruit bodies are rather soft and spongy. They last only for the season. They are from ten to twenty centimeters (four to eight inches) long by six to fifteen centimeters broad. They form larger masses where several are joined. The upper surface is rough with coarse tufts of mycelium giving it a very shaggy or hispid appearance. The honeycombed surface is below. The hymenium consists of quite regular pores with rounded openings in some specimens, or irregular, elongated and sinuous pores in other specimens, resembling the pores of *Dœdalea*. But they are evenly sunk in the substance of the cap and therefore lack the essential character of that genus. The walls of the pores are thin, and the edges often irregular and jagged.

There are two cases of its occurring on living coniferous trees which I have carefully studied. One case is that of a hemlock spruce (*Tsuga Canadensis*). The other is that of a red spruce (*Picea rubra*), the common timber spruce of the Adirondack region.

The hemlock spruce was a large tree, sixty centimeters (two feet) in diameter, on a steep slope in one of the deep gorges (Fall Creek) at Ithaca, N. Y.

This example was observed in the autumn of 1899. The fruit body of the fungus was situated on a large wound on the trunk near the base. It consisted of several caps closely joined at their origin from the trunk of the tree. A section through the entire fruit body showed the radiating lines formed by the general direction of the mycelium in the caps from their common origin in the tree trunk.

We have a clue to the manner in which the mycelium of the fungus entered this particular tree. A log lying in the foreground, close by the trunk of the affected tree, told the tale. This tree in its descent, years ago, struck the slightly projecting base of the standing hemlock, and knocked off a large area of the bark and cambium, or growing region, at this spot. This wound was too large and the tissues too much bruised to permit rapid healing over. It offered therefore a sure infection court through which the mycelium entered.

It was also shown that the healing has been going on for a long time from the margin of the wound. But the wound is so large it is yet far from being healed. Had it later healed over, it could not, of course, save the tree from destruction because the wound parasite was already permanently established in the interior, or heartwood. Thus the wound which gave entrance to the fungus mycelium also offers a place for its exit in the formation of the fruit body.

From the time the mycelium entered the trunk at this wound, which must have been from twenty-five to forty years ago, the mycelium gradually made its way into the heart, and from there grew downward into the roots and upward through the heart to the top of the tree. Its presence on the roots was determined by the occurrence of the fruit bodies from a few places on exposed parts of the large roots, while external evidence of its having reached the top of the tree was shown by a number of dead limbs in the top, some of which had fallen. Evidence of its having reached the top was also found on cutting down the tree, and taking out sections at different points in the trunk. Here was found an abundance of mycelium and the heartwood was in an advanced state of decay.

The mycelium advances in certain definite directions in the wood of the tree. This is probably due to the structure of the wood. It grows in three different directions: parallel with the axis of the tree trunk, *i. e.*, up and down; radially, from the center toward the periphery; and tangentially. At one stage of development the mycelium may be very profuse and abundant. It then is present in the form of cords or strands which lie radially or tangentially in the channels which have been dissolved by

the action of the fungus ferment on the wood. These strands lie quite close together and are parallel. After being developed in considerable abundance the strands of mycelium largely disappear leaving behind open channels and furrows through the wood in the radial and tangential directions.

Shrinkage of the wood occurs at the same time because of the disappearance of a considerable content of the water and of the wood substance. This shrinkage results in checking the wood into numerous minute cuboidal blocks, marked off primarily by the position and solvent action of the mycelium. This becomes more pronounced as the wood dries, if the tree is cut, or if blocks of the wood are cut from the trunk and allowed to dry. In the early infection of the wood, and the early stages in the advance of the mycelium, before the larger strands have become established, the openings made by the mycelium are very minute. They take the same direction as the larger opening. In fact, the mycelium, instead of making a general attack upon the tissues, begins its advance at certain regularly separated points, and then extends along in parallel lines. If the wood is cut out at this early stage, one can see these minute perforations thickly scattered over the exposed surface. Sometimes, even in this early stage, shrinkage of the wood will have taken place. If not very marked when freshly cut from the wood, the shrinkage of the wood on drying marks it off in a beautiful manner, by fine lines and holes, into cuboidal areas.

In many of these cases of the heart rot of trees, after the heartwood is well affected, the mycelium, being well established and vigorous, gradually encroaches on the cambium or living area beneath the bark. In this way, many of the branches in the top of the tree die, and in some cases later the cambium of the trunk may be so destroyed as to kill the tree outright.

The red spruce example, in the Adirondack woods, was a tree of handsome proportions near Piercefield Falls, on the Raquette River, left by the lumberman a few years prior to 1896, the season when I observed the tree. At some distance there was no indication that the tree was diseased and I enquired of my guide, who had at one time some experience in cutting timber, why the tree was left. "That tree ain't no good," he replied. As we ap-

proached nearer, he said, "Don't you see the gum running from all the knot holes?" This, he explained, was regarded as a sure sign of "heart rot." Furthermore the tree was "checked" on one side, the crack being quite large and extending for some distance. The check was probably caused by a wrench given the weakened tree during a heavy wind. There was no other external evidence that the tree was diseased, and to satisfy myself that the tree suffered from "heart rot," I had my guide cut out a few blocks of the wood from the trunk. Two inches beneath the bark the wood was found in a "dozed" condition. The heart was not in a very advanced stage of decay though the area was very extensive. The mycelium visible to the eye was very scanty. Still the wood showed numerous fine perforations, and as some shrinkage had taken place, it presented the very fine divisions into minute blocks described above. I then searched more carefully for some fruit form of the fungus and found at the ground level, buried under leaves, a fruit body of the *Polyporus borealis* between two buttresses of the base of the trunk. The tree was not felled, and consequently there was no opportunity of ascertaining the special mode of infection in this case.

POLYPORUS SULPHUREUS.

The sulphur polyporus has a very wide distribution and occurs on a great variety of broad-leaved trees as well as on certain of the conifers. It is known on the apple, walnut, butternut, locust, oak, ash, pine, hemlock spruce, and other trees. It occurs on living trees, the fruit bodies growing from knot holes or wounds from the mycelium in the heart of the tree; or the fruit bodies arise from portions of the trunk killed by the fungus. It is also a very common fungus on dead and decaying logs, stumps and roots.

The plant is easily recognized by the yellowish color of the caps, which are of the shelving form, sometimes scattered, but more often closely overlapping. Sometimes the caps are so closely crowded as to form a large tubercle from twenty to twenty-five centimeters or more in diameter. The upper surface of the cap is a bright orange red, while the lower surface, the honeycombed fruit surface, is sulphur yellow. The fruit bodies

are rather soft, the color soon fades and they are quickly attacked by insects, or decay after several weeks. They are short lived therefore, while the mycelium within the trunk is perennial, or at least lives from year to year without an annual infection.

Oak Tree killed by Polyporus sulphureus. A scarlet oak tree (*Quercus coccinea*) growing near the grounds of Cornell University was under observation for several years. The tree was standing on the edge of the Fall Creek gorge. It was first observed in 1897. At this time the mycelium of the sulphur polyporus had advanced so far from the heartwood into the sapwood, that the latter, as well as the cambium layer, on one side of the trunk near the base, had been killed. This gave an opportunity for the exit of the fungus and the formation of the fruit bodies on the outside. They were fine specimens, but were much more scattered than is usual with this species. The fruit bodies appeared during the succeeding seasons of 1898 and 1899. During the latter season the tree died from the injuries of the mycelium in its advance on the cambium, or living portion, of the trunk. It was felled, and several sections were cut out from the trunk for observation.

The decay of the heartwood had reached an advanced stage so that it was quite soft, and the moisture content was much less than in healthy trees. The lessening of the water content of the heartwood during the growth and spread of the mycelium caused a shrinkage in the wood. This produced several radial checks into which the mycelium had grown forming sheets of pure mycelium, sometimes called "punk."

Polyporus sulphureus imprisoned in a White Oak. A white oak tree about forty years old was growing quite close by the side of a larger tree on the grounds of Cornell University. The tree leaned slightly away from the larger one and there was a one-sided development of the branches induced by stronger illumination from that side.

The tree was felled in order to see if there was a corresponding asymmetry in the annual growth of the trunk which might be manifest in the excentric position of the annual rings. Before cutting the tree down there was no evidence that it was diseased. The

trunk to all external appearance was sound. There were no broken limbs, no wounds, visible. On cutting the trunk into sections to study the annual rings, the heartwood through a large part of the trunk presented unmistakable evidences of partial decay, following many of the annual rings and along by the medullary rays. The wood in these areas was being disorganized by the mycelium, and the latter was forming the incipient stages of punk.

The case was an interesting one, since the question arose as to how the fungus, now completely imprisoned, gained entrance to the trunk. The butt was sound, so the fungus could not have entered through the roots. Perhaps it entered at a large branch broken a number of years ago and now completely healed over.

All of the sections showed more or less decay at the central core of the heartwood where some of the wood was so badly decayed in some sections as to break out or crumble from the friction of the saw. One of the sections, not far from the base of the trunk, presented on the lower end, and near the periphery, a circular black area, resembling the dead remnant of a branch which might have broken off years ago, and healed over. On the surface of the same side of this section was a prominent enlargement in the trunk, resulting from the healing process. But the evidence of a wound here was largely obliterated because the old bark had formed over the surface. There was only a minute opening, very obscure, which was not completely healed over.

By examining successive sections of the trunk below this one it was observed that this black "core" representing the broken portion of the young tree gradually came to lie exactly in the central core of the trunk. This indicates quite clearly that the injury occurred to the tree in the sapling stage, and that the sapling was broken off instead of one of the branches. One of the upper branches then became the "leader" and in course of time the broken end of the sapling was enclosed by the healing tissue.

This section of the trunk was then sawed through lengthwise and in such a direction as to split the core of the dead sapling radially from the center of the new trunk. A view of one-half of this section was photographed. It showed the origin of the branch which became the new "leader" of the tree, as well as

the large and irregular end of the broken sapling covered over by the healing tissue.

The cross section shows that this injury occurred more than thirty years ago, very near the time that Cornell University was founded. Some accident, the cause of which we cannot now determine, befell this tree in its youth and the sapling was broken off, while one of the topmost remaining branches in time replaced the main trunk.

An injury resulting from this kind of fracture leaves a long and slivered end some distance from the point where healing takes place. It must be a number of years, then, before the healing process can advance so far as to cover the fracture. In this instance over thirty years elapsed. The broken and slivered end of the sapling offered the most favorable lodgement place for spores of fungi, and for the accumulation of detritus resulting from the constant weathering of the exposed surface. In these places moisture is also conserved. The conditions presented are favorable for the germination of the spores and entrance of the mycelial threads. No more favorable infection court could be provided whereby the fungus is enabled to enter the heartwood.

From this point of infection the mycelium spreads both ways, down the old trunk of the sapling, and upward in the branch which forms the newly established leader. The progress of the fungus is comparatively slow, and the disorganization of the wood accompanies it. The slow growth of the mycelium is probably due to several causes, the resistance which it meets from the wood, the action of tannic acids in the heartwood, as well as to the small amount of air in the interior of the tree. When sections of the trunk were cut, and piled together, the mycelium at the cut surfaces grew very rapidly. The mycelium here had access to air, and the moisture was conserved by the cut surfaces being in contact. In this way it was easy to demonstrate the presence of the mycelium in parts of the wood which to the eye appeared sound. The mycelium grew out from the wood into the moist air, along the concentric annual rings and the medullary rays, so that within twenty-four hours the location of the mycelium at these points was plainly demonstrated, and photographs taken at this time marked the location

of the mycelium in the infected areas. In several days' time, however, the mycelium spread out between the cut surface forming thin sheets of "punk."

POLYPORUS IGNIARIUS.

This species occurs on broad-leaved trees. It is known on the apple, oak, alder, beech, birch, maple and other species. The fruit bodies are hoof-shaped, very hard, almost stony, the upper surface black, while the lower surface, the fruiting surface, is brownish. The upper surface is marked by concentric furrows and ridges which mark off the annual layers. The fungus is thus perennial.

It is very generally distributed through hardwood forests. It is especially abundant in certain hardwoods in the Adirondacks. In some sections a large percentage of the beech, birch, and maple is affected. A quantity of the wood of affected trees was collected both at Childwood, St. Lawrence County, in 1896, and at Clearwater, Herkimer County, in 1898. At the latter place, the second flag station north of Fulton Chain, on the New York Central Railroad, there were excellent opportunities for studying it on the maple, and for determining the conditions which favor the entrance of the fungus into the heart of the tree. Since the mycelium cannot enter through the living cambium of the tree, an "infection court" must first be provided. These infection areas are provided in a variety of ways, in general their origin being the same as for other timber-destroying fungi which enter through wounds.

The conditions prevailing in a large portion of the mixed forests of the Adirondack region are such that a very common point for entrance is provided by the falling of the lower limbs. In the mixed forests the spruces and pines tower so far above the hardwoods as to cut off much of the light. The hardwoods are thus so shaded that the area of foliage is considerably lessened, many of the trees having few limbs, and then bearing few leaves compared with trees in the open, or even in a hardwood forest where all the trees have an equal chance for light.

A maple tree about twenty centimeters (eight inches) in diameter in the mixed forest at Clearwater had been affected by the

Polyporus igniarius for a number of years. The fruit body was several years old, of a triangular shelving form, and fifteen centimeters broad. Several entire sections of the trunk, one of them bearing the fruit body of the fungus, were collected and shipped to Ithaca.

Cross sections of the tree present a very characteristic and often beautiful marking of the wood due to the different stages of decay and the coloration of the wood. The more advanced stages of decay lie at the centre, the less advanced ones towards the periphery. The sound wood at the periphery is limited from the decayed area toward the centre by a broad and irregular discolored area. The discolored area is of a light brown color, and this is farther sharply defined from the pale yellowish white area within by a narrow black line. The later stages of decay in this maple tree advanced toward the periphery in separated columns, showing on cross section a radiating or digitate figure. The radiations, or figures, alternate with dark areas which extend inward from the periphery. Sometimes this figure is quite regular around a portion of the margin, while other portions are very irregular. The decay of the wood seems to proceed in waves from the centre toward the periphery, so that there appear several different stages. The outer one is marked by the dark discolored area, the next is pale yellowish white, the wood being quite soft, and an older and more advanced area at the centre of the heart. These different stages in the process of decay from the centre to the periphery are usually limited by the black line, which is bordered by a more or less well defined corona of color, darker than the area upon which it is advancing. In many cases these areas of decay progress very irregularly, and the figure becomes complicated and confused, especially in the later stages of the decay of a tree, so that dark lines extend very irregularly.

An examination of several maple trees bearing the *Polyporus igniarius* gave evidence that the peculiar discoloration of the wood accompanied the mycelium of this species of fungus, and might perhaps be sufficient to identify the species even where no fruit form of the fungus was present. An examination of the trunks of the beech bearing the *Polyporus igniarius* collected at Childwood, N. Y., in 1896, presented the same characteristic coloration

and marking. The maple is said by some lumbermen to be troubled by a disease which they term "black heart." It would be interesting to know if the coloration produced in the heart by the action of the mycelium of *Polyporus igniarius* is identical with this "black heart" disease.

It now becomes a matter of interest to determine the mode of entrance of the mycelium of this fungus into the tree. The fruit bodies were found to be situated at wounds. These wounds, or places of exit for the fruit form of the fungus, were "knot" holes formed by the dying away of the lower limbs, and the failure of the healing tissue to close the wound thus formed. The fruit form can make its exit through quite a small opening, and usually does, growing to larger dimensions outside as it ages. The first year's growth of the fruit form may then be but a small protuberance from one to two centimeters in diameter and showing no fruiting surface. This often increases in size each year, slowly, until from four to five centimeters in diameter, when it may increase more rapidly and each year form a new fruiting surface beneath.

A young fruit form was found on a trunk of a maple ten centimeters in diameter. This was the only evidence that the tree was diseased, all the other wounds at fallen limbs having healed over. A section of the trunk showed that the heart rot had begun. It was in the first stages of the disease and confined to a limited area, —that directly at the centre of the heart. There was present here only the discolored area which is characteristic of the younger area in older stages of the disease, described above. It is quite likely that the fungus enters at these slow healing wounds where the lower limbs have fallen, and that in some cases the wounds might entirely heal over and imprison the mycelium before the fruit bodies had an opportunity to form. That there was abundant opportunity for the mycelium of the fungus to enter at these wounds is shown by the evidence of a large proportion of the young maple trees in the mixed forest at Clearwater.

I have already called attention to the deep shade in the spruce woods where the tall spruces overtop the broad-leaved trees, and of the effect which this shade has in checking foliage development on the younger maples. Even on the young and middle-aged maples there are comparatively few branches, and these near the

top of the tree, the lower branches having died and dropped off. The same can be said of the beeches, birches, and other broad-leaved trees. Even on these topmost branches there are comparatively few leaves, because of the low light reaction. This means then that a comparatively small amount of the carbohydrates necessary in the formation of cell walls and woody tissue is manufactured. Consequently growth and the formation of wood goes on slowly. This interferes in a striking way with the healing processes needed to cover up the wounds caused by the falling limbs.

When there is an abundance of foliage and light, carbohydrates are formed in sufficient abundance to heal at a rapid rate. The healing tissue is firmer than the normal wood and working from within and close to the branch soon heals over and excludes the mycelium of the timber-destroying fungi. On the other hand, when there are few leaves and a small amount of starch is formed, the healing process goes on slowly, and before the opening caused by the falling limb can be closed, the portion of the branch exposed first undergoes weathering, and later the mycelium lays hold and enters, reaching the heart of the tree before the barrier of healing tissue is formed. From observations during several seasons it seems that this is a very common mode of entrance for the timber-destroying fungi in the broad-leaved trees.

A number of cases observed at Clearwater offer striking examples of the slowness with which the healing process goes on at branch wounds. The healing tissue formed slowly and did not close up against the base of the branch because of the small percentage of newly formed plant substance. Then for a series of years the healing would cease and an area around the knot would die back. Then for another series of years the healing would begin and advance over a portion of this dead area, when another period would intervene during which a still greater area would die back. In this way large and ugly open ulcers are formed, in which the wood within is exposed. This condition I have seen in young maples. On a number of them there were no fungus fruit bodies, but a section of the trunk showed all the characters of the heart rot caused by the mycelium of *Polyporus igniarius*.

The *Polyporus igniarius* has been known for a long time to in-

habit fruit trees, especially the apple, peach, etc., under certain conditions. During August, 1900, I observed an apple tree by the roadside a few miles south of Cortland, N. Y., with fruit bodies of this polyporus on it. A number of years ago the tree had been pruned, by cutting several large limbs near the trunk, and others out some distance from the trunk. The tree was probably diseased at that time and perhaps these limbs were dead or dying. This may have led to their amputation.

In all cases the fruit bodies of the fungus were formed at these cut surfaces, there being no other place of exit. The tree was probably seriously wounded when young, and the mycelium entering had spread all through the heart of the trunk and branches, but was unable to form the fruit bodies until the larger limbs were pruned.

Several of the branches of this apple tree, bearing fruit bodies, were taken for examination. The character of the heart rot is in all essential respects the same as those observed in the maple and beech.

Trametes abietis.

This plant is common on spruces and balsams. It is a shelving form, and much smaller than the species of polyporus just described. The caps stand out from the wood from two to five centimeters, are somewhat triangular in side view, and broader than long. The base is usually spread out where it is attached to the tree, and often the entire plant is spread over the surface of the wood. In the latter case no shelf form is developed. The upper surface of the shelf is marked by concentric furrows and ridges, and is more or less velvety or hairy. When young the fruit bodies are tawny in color, but in age they become a darker brown, especially above, while the fruiting surface is a yellowish brown.

Trametes abietis on the Red Spruce. An interesting example of a red spruce (*Picea rubra*) was examined during September, 1898, in the Adirondack mountains. This was near Nehasena, Herkimer County, on the tract owned by Dr. Seward Webb. Through the courtesy of Prof. C. S. Graves, who then had the supervision of the forestry operations on this tract, I had the privilege of following the lumbermen for two days to inspect

trees, or portions of trees, which were discarded after they had been felled.

In this particular case the entire tree had been discarded, although two logs had been cut from the trunk. On approaching the tree I first came upon the stump, and searched here for some evidence of the reason for rejecting the timber. Near the periphery of the stump, in the older sapwood near its junction with the heartwood, was a crescent shaped area in cross section about three centimeters broad and fifteen centimeters long. This was distinctly marked off from the surrounding portion by the coarser fractures of the wood from the crosscut saw used in felling the tree. This indicated that the wood was here slightly "dozed." The remainder of the stump was sound. This small area, showing such a slight alteration in the wood, probably would not have been considered objectionable.

On examining the cut made for the first log, sixteen feet above, the entire heart proved to be badly decayed. A large part of the sapwood was also invaded, and the cambium was being encroached upon. There remained only a thin shell of living and unaffected tissue underneath the bark. The heartwood was so soft that the fracture from the saw teeth was irregular, roughly cut and partially "ironed" down by friction from the saw blade. Still another log above this one had been cut off by the woodmen in the hope that the heart would be sound, and that a good log could be obtained near the top. This cut, however, presented a condition similar to the first one, — the heartwood and sapwood were badly decayed. This condition was sufficient to cause the abandonment of the entire tree. There were no evidences, on the trunk below the branches, of the fruit bodies of any fungus, nor of any injury which might have afforded an entrance for the fungus. The cut ends of timber were so badly roughed up by the saw that no structural characters in the diseased timber, which might aid in the determination of the species of fungus, could be seen. The next step was to determine the fungus and the place where it entered the tree.

Since the decay at the stump was so slight, and the diseased area so small in comparison with the extensive injuries farther up in the trunk, it was quite evident that the fungus had not entered

from below. Upon searching in the top of the fallen tree, it was found that the "leader" of the tree, when about five centimeters (two inches) in diameter, had been broken off, possibly by a falling tree thirty or forty years ago. This leader, as a dead, decorticated object still projected from fifteen to twenty centimeters, above the point where the healing process was going on. One of the upper branches at this point had become the leader.

This old fracture of the main trunk, years ago, very probably provided an opportunity for the entrance of the fungus. Most conifers are provided with a quantity of free resin in the young branches or shoots, or the growing portion of the trunk. As is well known this resin flows freely from fresh wounds, and often continues for some time from old ones. The presence of this resin, and its free exudation from wounds, is nature's most effective method of blocking the way to the entrance of timber-destroying fungi in the conifers. When the wound is small, or the broken branch or shoot is young, the amount of resin forms an effectual barrier against the entrance of this class of fungi. Where the wound is larger, or the shoot is older, the process of healing over requires many years, and the older portions of the wood do not yield so great an amount of free resin.

The broken shoot in this example was five centimeters (two inches) in diameter. Healing began from twenty to thirty centimeters below the broken end. After thirty or forty years the dead prong still projected from fifteen to twenty centimeters above the healing surface, and probably never would have healed over. During this long time the fungus mycelium had an opportunity to enter, travel down the heartwood of the trunk and reach the butt. It is interesting to observe that while the fungus mycelium gained entrance through the broken area of the leader in the top of the tree, and traveled downward, the greater injury to the trunk was some distance below. This is probably due to the greater amount of free resin in the younger portion of the trunk above. While the mycelium traveled downward through this, it did not spread rapidly here nor bring about such a complete disintegration of the tissue. Sections of the trunk just below the point where the fungus entered, and for some distance below, show that the heartwood is firmer and harder, though invaded by the mycelium. The wood

is also very much stained, brown irregular areas being often marked off by black lines or divided up into smaller areas by black lines. The mycelium also traveled upward in the newly established leader of the tree. From the trunk it had invaded many of the branches in the same way. As is usual in such cases a number of the branches had been killed. These dead branches then yielded readily to the disintegrating action of the fungus.

On a few of the limbs fruit bodies of *Trametes abietis* were found. A branch bearing a fruit body and broken at this point shows the gross structural characters of the wood affected by the mycelium of this species. At one stage in the decay of the wood there are numerous areas in which the process of disintegration is localized, or where it proceeds much more rapidly than in the surrounding wood. These isolated centres are quite evenly distributed. The wood is broken down completely and largely consumed, leaving a partial skeleton, or nearly all of it having disappeared. The remnant, as well as a thin layer of the bordering tissue, is bleached and white. It is thus in strong contrast with the reddish color of the surrounding wood where the decay has been checked, or has proceeded more slowly. This rapid local disintegration, then, forms numerous small "pockets" distributed through the affected wood at a certain stage in the progress of the disease. They are plainly visible because of the bleached tissue.

These pockets are a characteristic feature in one stage of the heart rot of the spruce from the mycelium of *Trametes abietis*. If they are found in the heartwood of the trunk of this individual spruce it would be quite conclusive evidence that the heart rot here was caused by this fungus and that the infection having occurred at the broken trunk in the top of the tree many years ago had gradually spread down the trunk to the base and out into numerous branches, some of which have been killed as a result. Sections of the trunk of this tree were cut out at different places and shipped to Ithaca for study.

On splitting sections of the trunk, cut from the discarded logs, these characteristic pockets were found to be present. They occur in the portions of the trunk where decay has made considerable progress, the entire heart being invaded, and the fungus encroach-

ing on the sapwood. When cut with the crosscut saw, or even with a finer saw, the ends of the blocks do not show the pockets, since the soft wood is so readily fractured by the teeth of the saw. But when the end of a block is planed off smooth the pockets in transection are quite distinctly brought to view. From a side and end view the pockets are seen to be oblong in side view and cylindrical in cross section. They are from two to three millimeters broad and from four to six millimeters long. In the younger portions of the trunk, some distance above where logs were cut, and below the point of entrance of the fungus, and thus nearer it, the pockets were not yet formed. This is probably due to the fact that while the mycelium first penetrated the heartwood here, the latter being younger was more resistant and the process of disintegration proceeded less rapidly. The pockets appearing on certain of the branches is accounted for by the fact that these branches had been killed for some time, and were consequently in a less resistant condition.

The formation of pockets by the rapid disintegration of the tissues at many centres recalls the "peckiness" of cypress wood caused by the mycelium of a fungus yet unknown. The pockets in the cypress wood are much larger, however, and the structural character of the affected wood is quite different. In the case of the cypress trunks affected with this disease known as "peckiness," it is believed that the fungus, while developing at the centres, excretes an enzyme, or "ferment," which permeates the surrounding wood and acts as an antiseptic which prevents the further disintegration. It is possible that this is to some extent the case in the formation of the pockets in the spruce timber; that is, that the wood intervening between the centre of rapid disintegration, becomes permeated with an enzyme excreted by the mycelium which renders it immune for a time, or at least retards the disintegration of the wood. But if this is the case, the effect of the antiseptic is not lasting. In the case of fallen logs affected by the *Trametes abietis* the decay continues until all parts of the wood are in a much decayed condition. Still, in such logs, it is quite evident that the progress of the disintegration has been intermittent, certain centres having first decayed, and in time spreading from these pockets to surrounding areas until all the

wood is brought under complete contribution to the mycelium. In such decayed spruce wood, there are farther evidences that the decay has spread from numerous centres which have been extended until they finally meet. This is shown in the varying coloration of the wood, and especially by black boundary or limiting lines.

Rhizoctonia.

There is a class of root and stem diseases which has been more or less obscure because the fungus concerned is not known in the fruiting condition, or, if so, only in a few instances. Since considerable information has been gained during the last few years in identifying the mycelium, and in separating it from well known fungi causing similar diseases, it may not be out of place to speak briefly of them here. There is an additional reason for speaking of them because the fungus is known to damp off a number of different kinds of seedling forest trees, and even in some places to climb and grow over the surface of the branches of mature pear trees.

I first observed the fungus in Alabama while studying the diseases of cotton. Here it was observed attacking seedlings, damping them off, or producing ulcers at the ground level, called by the planters "sore shin," and thought by them to be wounds caused by contact of the shovels used in cultivation. Later, in 1895, at Ithaca, N. Y., I found it a common cause of damping off of seedlings, especially of lettuce, radishes, and often of cabbages, egg plants, etc.

In a number of cases where these seedlings have been grown under conditions favorable for damping off, this *Rhizoctonia* has always occurred on them, while cucumbers, cress, sunflowers, etc., grown under the same conditions and in the same soil were affected with the well known damping off fungus, *Pythium debaryanum*. This is of interest not only in demonstrating that a large percentage of damping off of seedlings, generally attributed to the *Pythium debaryanum*, is caused by this sterile fungus, *Rhizoctonia*, but also in affording an example of selection of food on the part of different fungi in producing a similar disease.

While there is no fruit form by which we can identify this fungus, there are certain characters of the mycelium by which one

can quite certainly recognize it. The mycelium is branched and septate, that is, divided into cells which are several times longer than broad, and are thus cylindrical. Wherever a branch arises from the mycelium the position of the first septum, or wall, in the branch is at some distance from the parent thread, and this small section of the branch is clavate in form. This is one of the important characters which aid us in identifying the mycelium of this sterile fungus.

In later stages of its growth the mycelium tends to form cords on *rhizomorphs*, by the union into a strand of a number of mycelium threads. These strands in years become brownish in color. There are also formed on these strands rounded enlargements about the size of a radish seed or bird shot. These are known as *sclerotia*. These are also brownish in color, though at first white and fluffy. On the surface of these *sclerotia* are very loose threads, and these are very characteristic in form. They are broader than the threads of mycelium, the cells are shorter, and strongly constricted at the walls, so that the threads are of a moniliform, or beaded, appearance. While these chains of elliptical or barrel shaped cells are not spores, they often separate, two or three remaining joined together, and may then function as spores. So in this way, while the fruit form, with spores, is unknown, bodies are formed which function as spores, and the *sclerotia* probably are a resting stage to tide the fungus over unfavorable periods.

Aside from diseases in the nature of damping off of seedlings, some serious diseases of older plants have been traced to the action of *Rhizoctonia*, especially of the beet and potato. In the case of the beet, (see Cornell University Bulletin 186), the fungus obtains a hold at the bases of the leaves. The leaf bases become blackened, and this is followed by the withering of the leaves. Then the fungus works into the crown of the beet, producing a browning of the tissues here, and later, cracks appear. The disease breaks out at isolated points in the beet field and spreads radially from these centres. This disease is best known in New York state. It has been found in Ohio, also in Iowa. It probably has a very wide distribution in this country, though it appears to be different from the *Rhizoctonia* disease of the beet in Europe.

In Europe a *Rhizoctonia* disease of the potato has long been known. During the summer and autumn *Rhizoctonia* has been found on the stems and tubers of potatoes in New York. (See Cornell University Bulletin 186.) Examination shows that it is very common on the tubers; at least it was during the autumn of 1900. The infected plants sometimes are covered with the *sclerotia*.

It is evident from these, and similar studies, that there is no cure for the diseases caused by wound parasites after once the fungus has entered through the wound into the interior of the tree. For a few years there may be no apparent injury but with the lapse of time the tree becomes badly injured if not destroyed. The trees may live for years, or even a century or more, with the fungus inside, still growing. They may be so weakened that they are broken down or uprooted during strong winds. Shade trees may be rendered unsightly, and lacking in density of foliage. Fruit trees may be rendered less fruitful, if not ultimately killed. Timber trees in a very few years may be so injured as to be worthless for the market.

In their relation to forestry these studies emphasize the desirability of careful and economical methods in the felling of timber to protect the young stand from injury, in the supply of light to the forest floor, and in the protection from fire. For while many forest fires may not be so severe as to kill the trees outright the fire often scorches exposed roots, or the base of trunks, where the leaves are thick, or by a dead and dry log or stump, thus affording an entrance for these wound parasites.

In the handling of fruit and shade trees there should be the greatest care from the nursery stock to the fruiting tree, to prevent wounds. In pruning operations especially should there be care in pruning smooth and close to the trunk, followed by the use of some antiseptic wash or paint. Perhaps no better example of the good effects of proper pruning of shade trees can be seen than in the suburbs and vicinity of this city of Boston. But all through the land there are still numerous examples of careless and ignorant methods which should be speedily consigned to the past.

The lecture was illustrated by stereopticon pictures which added much to its interest and value.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, March 23, 1901.

A meeting for Lecture and Discussion was holden today at eleven o'clock, the President, O. B. HADWEN, in the chair.

The following lecture was delivered:

TWENTY YEARS' EXPERIENCE IN PEACH GROWING.

By JOHN W. CLARK, North Hadley.

The peach is a native of a warm climate. China and the United States are the only temperate climates where it comes to full perfection in the open air. Peach growing in the United States dates back nearly to the time of the first settlement, for, in 1633, we have account of peaches near Jamestown, Virginia, and peaches were the first commercial fruit grown in New Jersey. We also have accounts of fruit stones and kernels sent to Capt. John Endicott, Governor of Massachusetts Bay Colony, about 1629, among which were "Stones of all sorts of fruites, as peaches, plums, filberts, cherries," so we are safe in the conclusion that the peach was among the first fruits grown in this state.

Its cultivation however did not increase as rapidly in New England as it did further south, along the Delaware peninsula, where its growth was rapid,—so rapid in fact, that from this section the markets of the north and northeast have drawn the bulk of all their peaches until a very recent date. Up to about the year 1800 peaches flourished and orchards lived to a great age. There are accounts of old orchards throughout the peninsula, broken down and renewed perhaps a dozen times, that were healthy and bore good crops of fruit.

About the date given above (1800) a disease called the "yellows" appeared in the vicinity of Philadelphia, from where it spread north, south, east, and west, until it covered the whole peach area east of the Mississippi.

It is asserted that the yellows was not known in Massachusetts prior to 1837 and peaches were grown in the eastern part of the

state well into the fifties. After this the yellows became so destructive that the growing of peaches was practically given up for a time in this state. I can remember the old peach trees that grew back of my home in my childhood. This must have been toward the end of the fifties. After these old trees died out, the new ones planted were short-lived and I remember only two or three seasons when we had peaches, until the orchard that I planted in 1878 bore its first crop, in 1883, of about two thousand baskets. This, as far as I have been able to learn, was the first commercial crop of peaches of any considerable size ever grown in western Massachusetts, and it is from the impetus this modest crop of peaches, grown on Mount Warner, in North Hadley, in 1883, gave to the long discarded peach, that the revival of peach growing in Massachusetts dates. Connecticut which boasted a four million basket crop of peaches the past season, took her start from this same crop of fruit.

Whether the disease known as the yellows is contagious or not I will not pretend to say; but from its history and the way it acts I am strongly inclined to believe that it is. I think we have yet to learn just what it is and how it spreads. But one thing is plain to all successful peach growers: that when a peach tree ripens its fruit prematurely, the fruit being of a much higher color than healthy fruit of the same variety, and having a flat or bitter taste, the sooner all such trees are dug out by the roots and burned the better it will be for the owner. A tree in this condition can never be made to produce profitable crops of fruit. A new tree can be planted and brought to bearing age cheaper than a diseased tree can be nursed to a convalescent uselessness.

The best location for a peach orchard is on high ground above that of the surrounding country and having a good circulation of air. To show the importance of a high location let me state that in my orchard during the winter of 1898—'99 the thermometer registered twenty degrees below zero on the morning of December 14th. At the foot of the orchard three-fourths of the peach buds were killed. Halfway up the hill fully one-half of the buds were alive, while at the top three-fourths of the buds were uninjured. The difference in temperature between the top and bottom of the

orchard was four degrees, it being colder at the bottom. The difference in elevation was about two hundred feet. The peach buds today show nearly the same difference at the different elevations.

The soil best suited to the peach is a well-drained sandy loam. A heavy and wet clay is the least suited.

In making choice of varieties of peaches to plant in Massachusetts hardiness of tree and bud should take a prominent place. For commercial orchards the early ripening varieties should not be planted, as they will ripen at the same time that the markets are supplied with the best of southern fruit. Mountain Rose is the earliest variety I would advise planting. Of the older varieties, Crawford's Early and Crawford's Late and Oldmixon seem to be the best. Of the newer sorts Elberta and Champion stand well to the front. If Elberta proves hardy it will be a profitable peach to grow. Some markets call for yellow fruit, while others want white, and varieties should be selected according to the market to be supplied.

Before planting the trees the ground should be ploughed and fitted the same as for corn or potatoes. The best distance to plant peaches where they are planted alone is probably from fifteen to eighteen feet apart each way. This will give from one hundred and fifty-four to one hundred and eighty trees to the acre. It has been my practice to plant peaches with apples, setting three peaches to one apple. I know many object to this and perhaps with reason, but my chief object has ever been to get an apple orchard, peaches taking second place. Others may think that more can be made with peaches alone, but in my case the one crop sold in 1883, six years from planting, paid for the land and all the expenses of the orchard to that time; so that the apple orchard six years old cost me nothing. The peach orchard I now have, planted in the same way ten years ago, has given three good crops of peaches, and today gives promise of a better crop than it has ever borne. This does not prove to me that I made a very great mistake in setting peaches with apples; and if planting an apple orchard where the soil and location were suited to peaches I should set peaches between the apple trees as in the past.

Peach trees should be pruned to a straight stem about two and

one-half feet high when planting, and by annual pruning kept moderately low in order to lessen the expense in thinning, gathering the fruit, and pruning the trees. The whole surface of the ground should be kept cultivated from early spring to midsummer, from the time the trees are planted until the orchard is given up, for if there is one fruit which needs thorough cultivation it is the peach. The trees should be thoroughly examined for borers in early summer and late fall. When there is danger of mice gnawing the trees in winter, I know of no better way to protect the trees than to bank with earth, removing it as soon as it can be done in the spring.

Where the soil is of average fertility and the surface is kept thoroughly cultivated, little, if any, fertilizer will be needed until the trees begin to bear, unless it seems advisable to sow a little on the surface of the ground near the trees at the time of planting. The best fertilizer for the peach, and in fact for all of our fruits, is potash and phosphoric acid, to which may be added a little nitrate of soda, if the trees are not making enough wood growth, but this should be used with care. When the trees are old enough to bear and there is promise of a crop of peaches, a liberal dressing of the fertilizers named should be applied early in spring and sown broadcast over the whole surface, using one thousand lbs. of fine ground bone or South Carolina rock phosphate and five hundred lbs. high grade sulphate of potash to the acre.

The fruit should be thinned as soon as the June drop is over leaving the fruit three or four inches apart, removing all small and imperfect specimens. Thinning increases the size of the fruit to such an extent that the yield is not materially lessened, if at all; and it also increases the price at which the fruit sells. The drain on the tree will be much less when seventy-five peaches fill a half-bushel basket than when it requires one hundred and fifty, and the price at which the larger fruit sells will be nearly double that of the smaller.

If spraying is practised in a proper manner good results will follow; but if done in a careless way injury will result from it. When spraying peaches only the lime and sulphate of copper mixture should be used, as there is no need of Paris green or

other poisons on the peach. The solution should not be stronger than four pounds of sulphate of copper, and five pounds of lime to fifty gallons of water. Spraying just before the buds open, then after the fruit has set, and again in two or three weeks will prevent spotting and cracking of the fruit and make it much larger. If the season is unusually favorable to fungus growth it may be advisable to spray again.

Varieties of the peach vary greatly in their ability to withstand extreme cold and many claim that seedlings are more hardy than budded fruit. This statement is too general; at least this has been my experience, for with me different seedlings have varied in regard to hardiness as much as have the varieties of budded fruit and I think that a hundred different kinds of each taken at random would show about the same average in hardiness. Every budded variety was once a seedling and its hardiness today is the same as when first grown as a seedling, provided it is in as healthy a condition. It is also claimed that varieties having large flowers are more hardy than those having small flowers; this, I think, is not founded on fact. The Oldmixon, which has very small flowers, is one of the most hardy of our peaches.

Without taking the time to discuss the different theories given to explain why peach buds are killed, the one that in my opinion comes nearest to the real cause is this: — from the time the leaves of a tree drop in the fall until they start in spring there is more or less circulation of the sap contained within the cells of the buds going on and depending on the temperature. The sap contained in a tree during its dormant state is more dense and contains less water than when the tree is growing. Each liquid has its freezing point and such as contain water expand in freezing. The less dense the sap or the more water it contains the easier will it freeze solid; and the more dense the sap the more cold it will take to freeze it solid. In freezing solid the expansion of the sap ruptures the cell walls of the fruit buds and they are killed. The killing of the buds can be detected after a severe cold night in a very short time if the buds are taken into a warm room and thawed out. Within an hour's time the centre of the buds will show a discolored appearance and will turn brown in a few hours. If the sap in the cells does not expand enough to

burst the walls or if the tissues are elastic enough to escape being ruptured, the bud is not injured. This, to me, is the most plausible explanation of peach buds being killed when the mercury is little, if any, below zero and of not being killed when the mercury drops to fifteen or twenty degrees below zero; and also why one variety will stand more cold without injury than another. It depends on the amount of water in the sap and elasticity of the cell walls.

From 1882, with the exception of four years, 1888-'92, I have kept a record of the temperature whenever the mercury went to zero, or below, and the condition of the peach buds at these dates. The results are shown in the following table:

Lowest Temperature of the Winter and Date when Buds were Injured.

Winter of	1882–'83; Jan. 23,	8°	below.	Buds uninjured; good crop.
" "	1883–'84; Dec. 23,	23°	"	Buds killed.
" "	1884–'85; Dec. 20,	18°	"	" "
" "	1885–'86; Jan. 13,	14°	"	" "
" "	1886–'87; Jan. 9,	22°	"	All buds killed with exception of Oldmixon, and there were enough uninjured buds of this variety to give a full crop in the fall.
" "	1887–'88; Jan. 23,	22°	"	All killed but Oldmixon.
" "	1892–'93; Jan. 17,	14°	"	There was a good crop of fruit.
" "	1893–'94; Dec. 14,	14°	"	All varieties except Crosby and Oldmixon badly injured, but these bore a good crop.
" "	1894–'95; Jan. 20,	12°	"	A good crop of all kinds.
" "	1895–'96; Jan. 6,	14°	"	All killed.
" "	1896–'97; Feb. 7,	17°	"	All bore a good crop.
" "	1897–'98; Feb. 3,	22°	"	Nearly all killed; small crop.
" "	1898–'99; Jan. 2,	25°	"	Buds killed.
" "	1899–1900; Feb. 3,	14°	"	One-third killed; good crop.
" "	1900–'01; Jan. 20,	14°	"	One-half killed.

From this it will be seen that there were peaches when the thermometer registered 8, 22, 22, 14, 14, 12, 17, 22, 14 and 14 degrees below zero; and that the buds were killed when the thermometer went to 23, 18, 14, 14 and 25 degrees below zero.

One is often asked if it is not after the buds have started in early spring that they are most liable to be injured by the cold. At the south this is probably the case, but in Massachusetts I think it is not, for as far as my experience goes I have never had the fruit buds injured after Feb. 22nd. The nearest I ever came to having them killed after this date was the morning of the 10th of last May, when the thermometer stood at 20°. Peach buds were showing pink with a few flowers just open, but no injury was done. It has always been the severe cold of winter between Dec. 20th and Feb. 22nd that has destroyed the peach buds in my orchard.

That peaches can be grown in this state is an established fact, but I do not think that it will ever become what is called a peach state. Our winters are too cold and it will be only those who have a good location on high ground suited to the peach, who have a natural love for trees and fruit, and who will not get discouraged and give up when the mercury drops to 20° or more below zero, destroying the crop year after year, that will make the growing of peaches profitable. As I look back to the time when I grew my first peaches I fail to remember one person in my locality, among the many who were induced to plant peach trees by my success, that has not made a failure of peach-growing; and of those who plant peaches in this state I doubt if one in ten will make it pay. I believe in growing peaches in Massachusetts myself but do not believe in it for the majority, and although I am ready to put money into it if I can look after the trees myself I would not risk one cent in peaches if another was to care for the orchard.

Discussion.

The lecturer did not think that Massachusetts would ever raise enough peaches to make it worth while to have a law in regard to yellows. They might have a law to prevent plum wart. Much of the unhealthy condition of peach trees is due to borers and poor culture. One well acquainted with the yellows can distinguish this disease from the effects of borers.

The Crawford's Late peach is too late for some localities in New England, but where it is not it is a most desirable kind.

You want a good healthy growth of well ripened wood; if your trees go into the winter without having the wood ripened they will be more liable to be killed.

The lecturer thought ground South Carolina rock as good as ground bone. The experience of Dr. Fisher at Fitchburg, and the Agricultural College at Amherst is the same. Paris green is liable to injure the foliage; the foliage of the peach is very sensitive. As much harm as good has thus far been done by spraying peaches.

In Worcester it is reported that the buds are all killed. The lecturer thought there will be but a small crop this year.

Plant peaches on high land. They will not pay at the foot of a hill. Fifty years ago the State Board of Agriculture reported that peaches could not be grown as well as they were fifty years earlier.

People had called the lecturer foolish to plant peach trees, but while valuation generally has decreased, his land has increased fourfold. He thought our New England hills, fairly well situated, can be put to no better use than growing apples. It takes eight or ten years to get an apple orchard into bearing, and if you plant peach trees between the rows you can get a better start.

William C. Strong said he found the lecture very interesting and very instructive, but very discouraging. He has visited Mr. Thurlow's peach orchard and found his peaches as fine and luscious as any he ever tasted. He still believes we shall be able to raise fine peaches. Those raised in Massachusetts are better in quality than any brought into the state. At a meeting of the American Pomological Society two years ago he heard the statement that Mr. Morrill of Benton Harbor, Mich., got six thousand dollars for his crop of peaches when all others around him failed. He cultivated very thoroughly until the middle of August. He then sowed oats and allowed them to die down and cover the ground in winter. In the spring they were worked into the ground. The speaker said that he has great faith that some discovery will be made by which we may be able to grow peaches.

The lecturer said that the season at Mr. Morrill's was very unusual. He kept his orchard thoroughly cultivated; he went over it every other day. This retained the moisture of the ground, but it had nothing to do with the hardiness of the trees.

Only men who have a good location and who are born with a love for the business will succeed.

B. W. Barnard, of Grand Rapids, Mich., said that he has an orchard in Michigan in the same latitude as Boston. He has one orchard of three thousand trees and one of four hundred. He cultivates early in the season and ceases in July. One orchard was not cultivated the previous year and the buds went into winter in good condition. In the spring he had a branch examined and found the wood cells about one-third destroyed. If early cultivation is looked after the trees will bear even though the mercury has been as low as thirty degrees below zero.

The lecturer said he had come to the same conclusion in regard to the wood cells, and was glad to hear the same view expressed by some one else. With a cover crop mice are very liable to injure the trees. He does not grow clover in his orchard when there is a crop of fruit, for the trees need all the moisture in the ground. In a season when the trees do not bear he would sow clover or some other crop. You don't want to stop cultivation too soon; if you ripen the wood too soon the buds will start into late growth. It is a delicate question just when to stop. Late summer is a safe time. Get the trees in good condition to go through the winter. Mr. Barnard said that eighteen degrees below zero will kill buds in Michigan.

A lady inquired about spraying with whitewash and the lecturer replied that it keeps the wood cold, which is desirable in the south, but not here. We want to keep it warm. He would plant on high ground where there is a good circulation of air. One year when the fall was warm the buds started. That year the buds were killed at six degrees below zero. Buds are not so likely to be injured when covered with frost.

Varnum Frost had seen hundreds and hundreds of acres set out with peach trees which have all been failures. Many have used spraying mixtures on part of an orchard and have been unable to see any difference. So much science has got into agriculture that it is extremely difficult to raise anything. When he was a boy peach trees were as healthy as forest trees. He thinks so many chemicals have been introduced into the soil that it is upset and discouraged.

The President said he knew little about the yellows until 1840. Before that, peach trees might live to be fifty years old. In late years he has practised growing peaches from stones, getting the stones from a section where the yellows did not exist. Seedling trees would be no better than budded trees if the seed was unhealthy. Get stones from below Virginia or from California and you will have better success. He thinks that each fruit is endowed with a natural term of life, and if continued beyond that the trees are less healthy. The hardest work he ever had in farming was to sell his peach crop about 1850. He went into the market at eight in the morning and had to back up under a gas light till ten at night to sell a load. The lower rows in his orchard near a brook never bore fruit, while from those higher up there was a good crop. He agreed with the lecturer that raising peaches in Massachusetts is uncertain.

Samuel H. Warren said his father had a peach orchard which produced a good crop that sold at fair prices. One tree appeared to be a new early variety and he thought it would be a good plan to take scions from it. In a year or two the trees were all dead from the yellows.

Mr. Frost has a friend in Fitchburg who has a peach orchard of five thousand trees. He buys trees and sets them in grass land. Every fall he buys a hundred tons of hay and puts some around every tree. He winds tarred paper around the trunks to prevent the mice from gnawing and has never been troubled by them. He cuts the tops of trees off when he buys them and rubs off every eye except the low ones. He has his crop near the ground.

The lecturer said that cultivating and mulching amount to the same thing; he means shallow cultivation. Plough very shallow near the trees. Use a cutaway harrow if you begin early in the season. You may begin before the frost is out of the ground. The cutaway harrow does not work well on a hillside. With a spring tooth harrow you can keep the ground level.

Apple trees will do well in newly cleared land and peach trees also, only the work will be greater.

Jacob W. Manning said that in 1853 he gathered eight bushels of Crawford's Late peaches in Burlington and sold them in Boston for $32.00. Twenty thousand bushels were raised one year in Billerica but few were sold. The peach rot came in 1860.

MEETING FOR LECTURE AND DISCUSSION.

SATURDAY, March 30, 1901.

A meeting for Lecture and Discussion was holden at eleven o'clock today, Vice-President BENJAMIN P. WARE presiding.

The Committee on Lectures and Publication regret that they are unable to present more than the following abstract, prepared by the author, of the lecture delivered.

INSECTS INJURIOUS TO FRUITS AND VEGETABLES.

BY PROFESSOR H. T. FERNALD, Agricultural College, Amherst.

The lecturer stated that destructive attacks by insects were nothing new, being graphically described in several places in the Bible. During the last century, however, the injuries caused by insects had become more frequent and serious, the reason for which was due to several causes, the first and probably the most important of these being the introduction of injurious forms from other countries. More than seventy of our worst pests of the present day have been introduced from abroad and it is a noticeable fact that their work in this country is more destructive than in their native land. Modern methods of agriculture are also responsible for a portion of the increased loss, the modern tendency to a concentration of crops being distinctly favorable to the rapid multiplication and spread of the insects which feed upon them, while, finally, the great reduction in numbers of our insectivorous birds has removed one of the most efficient means for holding destructive insects in check. He then went on to speak of the scale insects as affecting fruit trees in this country, illustrating his remarks with lantern slide views of the insects described. The oyster-shell scale was shown and its life history briefly sketched. The lecturer stated that it was introduced from Europe during the latter part of the 18th century and is now generally distributed over the country, and while not usually destroying fruit trees is nevertheless very injurious to them. The scurfy scale was also treated of in a similar manner and a

slide showing where parasites had been at work destroying it was put upon the screen. The lecturer next took up the San José scale which, he stated, was by far the most serious scale with which we have to contend at the present time. He further said that it is in all probability a native of Japan and was first discovered in this country in California about 1870. Its life history was fully described and pictures showing its ravages were put upon the screen as was also a map of Massachusetts showing thirty-eight localities where the scale is now known to occur. The speaker stated that during the summer of 1900 he had received currants, pears, and apples so badly affected by this insect as to render them unsalable, these specimens all coming from places within fifty miles of Boston. The best treatment advisable for the oyster-shell and scurfy scales is to spray affected trees twice with kerosene emulsion or with a 10 per cent mechanical mixture of kerosene and water,—once about the 10th of June and again about the 25th of that month. For the San José scale, however, this treatment would be quite ineffective because of its different life history. For this insect the fumigation of all nursery stock before shipment was strongly urged and purchasers of fruit stock were advised to require a certificate of inspection and freedom from the scale with every lot bought, taking due care to note that the date of inspection is within a year of the date of purchase. Fumigation, however, was not recommended for general use because of its expense and the apparatus necessary, but whale-oil soap was suggested in its place, the most successful formula for its preparation being given. The speaker said that if the San José scale increased during the next ten years as rapidly as it had during the last five in this State, it would become a serious question whether any fruit at all could be raised in Massachusetts, and that if they wished to save their orchards the fruit growers of the State would find it necessary to give this insect much attention.

The lecturer then took up the asparagus beetle as an insect causing much trouble to market gardeners and sketched its life history and the best means for destroying it, for which purpose he recommended arsenate of lead. This was followed by a description of the cabbage worm which he said was, in spite of

nearly fifty years' experience with it, one of the most difficult cabbage insects to control. For that purpose he recommended the use of Paris green, explaining why any danger in the use of this insecticide was more apparent than real and stating his experience in its use, and also the practice of the large market gardeners around Philadelphia where this treatment has been followed for fifteen years with excellent results. He closed by urging a more careful study of the insects injurious to crops, stating that the annual loss from this cause was over $300,000,000 each year in the United States and that only a small part of this loss is unavoidable.

The lecture was illustrated throughout by lantern slides.

DISCUSSION.

Hon. Virgil C. Gilman asked whether scraping the bark of apple and peach trees on or before the first of June would destroy scales on the bark.

The lecturer said that the best time to scrape trees is during the winter but this is difficult and ineffectual. Spraying is cheaper and better. Scales on nursery stock and other young trees are found down to the ground, but as the bark grows thicker the old ones retreat.

The Chairman said that ten years ago the orange trees in California were infested with an injurious scale but a parasite has been introduced which has kept the scale in check.

The lecturer said that the scale on orange trees in California is not the San José but one that came from Australia. The San José scale multiplies more rapidly. The lady bird feeds on the San José scale and is a great help to orchard men, but we cannot hope that it will exterminate the San José scale because the latter increases so much more rapidly. The United States Department of Agriculture has sent an agent to Japan to learn what keeps this pernicious scale in check in that country. The tent caterpillar has been known for many years and has never been exterminated, but we have to fight it every year and we have learned that it can be kept down, and we must do the same with the San José scale. There is a possibility of controlling it, but not of exterminating it. The lecturer said that he was called upon to inspect a nursery

in another state, and that he refused a certificate of freedom from the San José scale. The owner sighed and said that he would send the trees to Massachusetts, where there is no law to prevent the introduction of the San José scale.

Varnum Frost said that the experiment stations had cost a good deal of money, and asked if there had ever been an insect during the last hundred years which had destroyed a crop so that there was not enough left to supply the wants of the people. The cabbage worm is a recent introduction, but cabbages are grown in the suburbs of Boston as well as ever. He regarded injurious insects as beneficial by stirring up cultivators to attend to their crops.

The lecturer said that it was impossible to take up all sides of the question in the time allotted to him. Except for insects human life on the earth would be ended in five years. There are good insects and bad insects, as there are good people and bad people. He had not attempted to develop a scare, but had simply stated what had occurred in other states but had not reached Massachusetts because it is so far north. His work was that of forewarning, and the map shows that the pest has already come. It is the people who have it who are making the outcry. Mr. Frost's view in regard to the benefit of insects may be correct, but they are not an unmixed benefit.

The Chairman said that asparagus is fit to cut in forty-eight hours from the previous cutting so that the eggs of the asparagus beetle do not have time to hatch.

The lecturer said that the eggs mentioned require four or five days to hatch, and if the asparagus is cut clean every forty-eight hours there is not time for them to hatch. When cutting ceases and the seed stalks grow up the beetles have their opportunity. Every farmer seems to have some neighbor who is not a good farmer to propagate insects for him.

At the suggestion of the Chairman a vote of thanks to the lecturer was unanimously passed.

EXPERIMENT STATION REPORTS WANTED.

The Massachusetts Horticultural Society is endeavoring to collect complete sets of the Bulletins and other publications of all the Agricultural Experiment Stations in the United States and Canada. Those named below are wanting, and any person having a spare copy will confer a favor by addressing the Librarian of the Society, Horticultural Hall, No. 300 Massachusetts Ave., Boston.

Alabama (Ag. and Mech. College Station).— Bulletins 4–6 (1884), 7–10 and 1–4 (1885), and 5–9 (1886). 7th Annual Report, for 1894, and 9th, for 1896.

Alabama (Canebrake Station).— All Bulletins later than 18, and all Annual Reports later than the 3d, for 1890.

Alabama (Tuskegee Station).—Bulletin 2.

Arizona. — 4th Annual Report, for 1893.

Arkansas.— Bulletin 1. All Annual Reports later than the 4th, for 1891, except the 8th, for 1895.

California — Bulletins 32, 1878, and 1, 2, 3, 5, and 50, New Series.

Colorado.— Bulletin 3.

Connecticut (New Haven Station).—Bulletins 1 to 67, inclusive. Annual Reports for 1877 and 1879 to 1883, inclusive.

Florida.— Annual Report for 1892.

Indiana.— (Purdue Univ. School of Ag.). — Bulletin 1. College Reports 1 to 14, inclusive.

Iowa.—Bulletins 54, 55 and 56. (The original bulletins.)

Kentucky.— Bulletin 10.

Michigan.— Special Bulletins 1, 3, and 5. 6th Annual Report, for 1892-93 (contained in Report of Michigan Board of Agriculture, 1893).

Missouri. — Bulletins 9, 13, 15, 16, 19, 20, 25, and 26 of Old Series. All Annual Reports since the 1st, for 1888, except those for 1896 to 1898, inclusive.

New Jersey.— Bulletins 1, 4, 5, 15, 27, and 28.

New Mexico.— Eighth College Catalogue, 1897–98.

New York (Cornell). — 1st Annual Report, 1881–82, and all between that and 1888, except the 2nd. for 1882-83 (Reports of Agricultural Department of Cornell University.)

North Carolina. — Bulletins 1 to 56, inclusive, and 69, 2d ed. 1st to 7th Biennial Reports. Meteorological Division. Bulletin 2 (*68b*). Special Bulletins 1 (*77a*) and 4 (*82a*). Weekly Weather Crop Bulletins 1–21, 1888; 1–24, 1889; 1–25, 1890; 2 and 4, 1891.

North Dakota.— 4th Annual Report, for 1893.

Ohio.— All Bulletins of First Series, except 16, 17, 18, and 19.

Oklahoma. — All Annual Reports previous to that for 1896–97, except that for 1893–94.

Pennsylvania. — Annual Reports for 1869, 1872, 1879–80, 1881, 1882, 1883, and 1884. [All issued by the State College.] Bulletin of Information No. 1.

South Carolina.— All Bulletins of the Old Series (previous to 1888) on the work of the Experimental Farm of the South Carolina College. 3d Annual Report, for 1890, and 6th, for 1893.

Texas.—College Bulletins 1–5, 1883–1887.

Virginia. — 10th Annual Report, for 1898-99.

Washington. — 6th, 7th, and 8th Annual Reports, for 1895–96, 1896–97, and 1897–98.

West Virginia.— Special Bulletin — Potash and Paying Crops, 1890.

Wyoming.—Bulletins 2 to 4, 9, and 10.

Ontario Department of Agriculture, Toronto.—Bureau of Industries. — Agricultural Returns to the Ontario Bureau of Industries, Nov. 1882 (5th), Aug. 1883 (7th), and Nov. 1887 (20th).

TRANSACTIONS

OF THE

Massachusetts Horticultural Society

FOR THE YEAR 1901.

PART II.

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CONTENTS.

PAGE

BUSINESS MEETING, April 6, 1901; Memorial of Agustus Parker, 147. Offer of silver and bronze medals accepted from the Society of American Florists, 148. Communication from the Committee on Native Plants, 148. Disposition of the statues on the Tremont Street Building, 149. Three Members and two Corresponding Members elected, . . . 149

BUSINESS MEETING, May 4; Rate of interest on J. D. W. French Fund, 149. Resignation of W. W. Lunt, Chairman of the Committee on Plants, 150. Appropriation for Committee on Lectures and Publications, 150. Charles W. Jenks appointed a Committee on Native Plants, 150. Twenty-Seventh Biennial Session of the American Pomological Society, 150. Three Members elected, ... 151

BUSINESS MEETING, June 1; A quorum not present, ... 151

BUSINESS MEETING, July 6; Arthur H. Fewkes elected Chairman and R. M. Grey a member of the Committee on Plants, 151. Letters from Professor L. Wittmack and R. D. Cleveland, 151. Weekly Summer exhibitions to be omitted this year, 152. American Pomological Society, 152. Memorial of Edwin C. Lewis, 152. Seven Members elected, . . . 153

BUSINESS MEETING, August 3; Appointment of Nominating Committee, 153. International Conference on Plant Breeding and Hybridization, 153. Letter from Mrs. Jane Lewis, ... 153

BUSINESS MEETING, September 7; Report of Nominating Committee, 154. Delegates to the Twenty-Seventh Biennial Session of the American Pomological Society, 154. Treasurer to provide a place for Annual Election, ... 154

BUSINESS MEETING, September 14; Adjourned Meeting; Certain legal questions regarding passageway, 155. Building Committee requested to report, 155. Decease of George A. Nickerson, ... 155

BUSINESS MEETING, September 21; Adjourned Meeting; Agreement regarding passageway, 156. Report of the Building Committee and new building on Massachusetts Avenue accepted, ... 156

BUSINESS MEETING, October 5; Annual Election, 156-158. Report of the Committee on the Revision of the Constitution and By Laws indefinitely postponed, 157. Committee appointed to celebrate the opening of the New Hall, 157. Appropriation voted for Building Committee, 157. Agreement concerning passageway, 157. Three Members elected, . 158

BUSINESS MEETING, November 2; Appropriations for prizes for 1902, 158. Appropriation for Committee on Lectures and Publications, 159. Furnishings for the Library, 159. Building Committee requested to report cost of new building, 159. One Member elected, ... 159

PAGE

BUSINESS MEETING, December 7; Reports of Committees on Vegetables, Flowers, Plants and Library, 159-160. Schedule of Prizes for 1902 presented. Memorial of Thomas Meehan, 160. Use of Halls tendered to Mass. State Board of Agriculture, 161. Sunday exhibitions, 161. One Member elected, ... 161

BUSINESS MEETING, December 21; Report of Committee on Fruits, 161. Statements from Committees on Gardens and Flowers, 162. Prizes for Timber Trees to be changed, 162. Report of Secretary and Librarian, 162. Sunday exhibitions discussed, ... 162

REPORT OF THE OPENING FLOWER SHOW, ... 163-167

DEDICATION OF THE NEW BUILDING, 168. Address of General Appleton, 170-183. Address of President Hadwen, ... 183-184

DESCRIPTION OF THE NEW BUILDING, ... 185-190

REPORT OF COMMITTEE ON PLANTS, 191-197. Prizes and Gratuities awarded, . 197-205

REPORT OF COMMITTEE ON FLOWERS, 206. Prizes and Gratuities awarded, . 207-215

REPORT OF COMMITTEE ON FRUITS, 216. Prizes and Gratuities awarded, . 217-226

REPORT OF COMMITTEE ON VEGETABLES, 227. Prizes and Gratuities awarded, 228-231

REPORT OF COMMITTEE ON GARDENS, 237. W. W. Rawson's Lettuce House, 237. Peter Fisher's Carnation House, 238. Mrs. David Nevins' Estate, 239. W. H. Heustis' Strawberry Garden, 239. Geo. D. Moore's Cucumber House, 240. Estate of H. H. Rogers, 241. The Oliver Ames Estate, 241. Estate of C. H. Tenney, 242. W. P. Lothrop's Dahlia Garden, 242. Waban Rose Conservatories, 243. Estate of Col. Charles Pfaff, 243. Estate of E. S. Converse, 243. Mrs. A. W. Spencer's Chrysanthemum House, 244. Estate of Frederick Parker, 244. R. & J. Farquhar's House of Begonia Gloire de Lorraine, 245. Prizes awarded, ... 246

REPORT OF COMMITTEE ON SCHOOL GARDENS, ETC., 248. Boys' Gardens in Dayton, Ohio, 248, 249. School Gardens, School of Horticulture, Hartford, Conn., 250, 251. School Garden, Bath, Maine, 252. School Garden of the Twentieth Century Club, Boston, 252, 253. The George Putnam School Garden, Boston, 253-257. Interest in School Gardens increasing, 257. Children's Herbariums, 258-260. Prizes and Gratuities awarded for School Gardens and Children's Herbariums, ... 260-262

REPORT OF COMMITTEE ON NATIVE PLANTS, ... 263

REPORT OF COMMITTEE ON FORESTRY AND ROADSIDE IMPROVEMENT, . 264-265

REPORT OF THE COMMITTEE OF ARRANGEMENTS, ... 266-267

REPORT TO THE STATE BOARD OF AGRICULTURE, ... 268-269

REPORT OF THE COMMITTEE ON LECTURES AND PUBLICATIONS, . . . 270-271

REPORT OF THE COMMITTEE ON THE LIBRARY, ... 272

REPORT OF THE SECRETARY AND LIBRARIAN, ... 273-275

REPORT OF THE TREASURER AND FINANCE COMMITTEE, ... 276-281

MOUNT AUBURN CEMETERY, ... 282-283

OFFICERS AND STANDING COMMITTEES FOR 1902, ... 284-286

MEMBERS OF THE SOCIETY, Life, 287-295. Annual, 296-298. Honorary, 300. Corresponding, ... 301-303

The New Horticultural Hall: Erected A. D. 1900.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, April 6, 1901.

A duly notified stated meeting of the Society was holden at eleven o'clock today, the President, O. B. HADWEN, in the chair.

Ex-President William H. Spooner reported the following memorial of the late Augustus Parker, which was unanimously adopted:

Mr. Augustus Parker of Roxbury, a member of this Society, died on the 27th of February, at the age of seventy-four.

My first acquaintance with Mr. Parker was about the year 1856, when he was engaged in the coal business, but his predominating taste was for farming, for which he had an early training and to which he subsequently turned his entire attention.

His farm was a portion of the Seaver estate near Grove Hall, and he managed it skilfully, making its products desirable to many purchasers.

His grandfather, Hon. Nathaniel Seaver, with whom he lived from early childhood, brought scions of the Seckel pear from Washington (while a member of Congress) with which he grafted a tree standing on the old place on Blue Hill Avenue.

Mr. Parker continued farming until the growing demand on his lands for residential purposes induced him to sell.

He was much interested in local history and genealogical research.

He became a member of the City Council of Boston in 1875, and was a member of the Board of Overseers of the Poor from 1878 to 1880.

He was elected a corporator of the Franklin Savings Bank in January, 1877; also a trustee and member of the Board of Investment, and later Vice-President, and succeeded Hon. F. W. Lincoln as President in February, 1898.

He was elected a member of this Society in 1849, and was a Vice-President in 1893, '94, '95, and '96.

The Committee on Lectures and Publication reported a deficiency of five dollars in the appropriation for their use, and asked for an additional appropriation of that amount, which was voted, subject to the approval of the Executive Committee.

The Secretary read a letter from the Secretary of the Society of American Florists, stating that one Silver and one Bronze Medal had been appropriated by that Society to be awarded through the Massachusetts Horticultural Society, at one of their regular public exhibitions, for new and meritorious plants of American origin, but only to such exhibits as are considered worthy of such an award.

The offer was accepted and the thanks of the Society were voted therefor and the communication was referred to the Committee on Prizes to be put in proper form.

Henry L. Clapp, Chairman of the Committee on School Gardens and Children's Herbariums, stated that that Committee were unable to attend to the work of awarding prizes for Native Plants, and offered the following vote:—

Voted, That the work of judging native plants and awarding prizes therefor be referred back to the Society for reassignment to some other Committee now existing, or to some committee who may be hereafter appointed.

H. L. Clapp, *for the Committee on School Gardens and Children's Herbariums.*

This vote was laid on the table, and the subject was referred to a Committee consisting of Mr. Clapp, Charles B. Travis, and Mrs. H. L. T. Wolcott to consider and report upon.

The President reported the following recommendation from the Executive Committee, —

Recommendation to the Society,

Voted, That the consideration of the ultimate disposition of the statues now on the outside of the present building be postponed for the present, and that the removal of them and their temporary deposit be left to Mr. Wheelwright, the architect, and the Building Committee, with full powers.

This recommendation was adopted.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

PETER FISHER, of Ellis,
MISS ABBY A. BRADLEY, of Hingham,
MISS MARY F. BARTLETT, of Boston.

On recommendation of the Executive Committee

GEORGE FRANCIS ATKINSON, Professor of Botany in Cornell University, Ithaca, N. Y., and
PROFESSOR L. WITTMACK, Secretary of the Royal Prussian Horticultural Society, Berlin, Prussia,

were elected Corresponding Members of the Society.

The meeting adjourned to Saturday, May 4, at such place as might be provided.

BUSINESS MEETING.

SATURDAY, May 4, 1901.

An adjourned meeting of the Society was holden today at eleven o'clock, at No. 227 Tremont Building, Boston, the President, O. B. HADWEN, in the chair.

The following vote offered by the Treasurer was passed:

Voted, That the rate of interest to be credited annually to the J. D. Williams French Fund, for the purchase of books for the Library, be at the rate of four per cent.

A letter from William Wallace Lunt, Chairman of the Committee on Plants, resigning that position on account of business engagements, was read. It was voted that Mr. Lunt's resignation be accepted, with regret that he feels it necessary.

On motion of Ex-President William H. Spooner it was

Voted, That the Committee on Plants be authorized to recommend candidates to fill the vacancies in the Committee and in the Chairmanship.

The President, as Chairman of the Executive Committee, reported that that Committee had approved the appropriation of five dollars voted by the Society at the April meeting to cover the deficiency in the appropriation for the Committee on Lectures and Publication.

Henry L. Clapp, Chairman of the Committee to consider the subject of awarding prizes for native plants, made a report which was accepted, and on motion of William H. Spooner it was voted that Charles W. Jenks be a Committee to award prizes and gratuities for native plants with the liberty to call in the assistance of such experts as he may desire.

A letter was received from W. Prentiss Parker, acknowledging, in behalf of his mother and sisters, as well as himself, their grateful appreciation of the memorial of the late Augustus Parker adopted by the Society.

A circular was received from the President and Secretary of the American Pomological Society, with the information that the Twenty-Seventh Biennial Session of that Society will be held at Buffalo, N. Y., on the 12th and 13th of September, and inviting the attendance of delegates and the contribution of fruits to the exhibition, and additions to the membership of the Society.

A letter was received from George Francis Atkinson, Professor of Botany in Cornell University, Ithaca, N. Y., acknowledging receipt of the information of his election as Corresponding Member of this Society, and expressing his appreciation of the honor conferred upon him.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

THOMAS E. PROCTOR, of Boston,
MISS MARY D. BATES, of Ipswich,
MRS. AUGUSTUS P. GARDNER, of Hamilton.

Adjourned to Saturday, June 1.

BUSINESS MEETING.

SATURDAY, June 1, 1901.

The meeting of the Society on the 4th of May adjourned to today, but there was no quorum present and the meeting was dissolved.

BUSINESS MEETING.

SATURDAY, July 6, 1901.

A duly notified stated meeting of the Society was holden at eleven o'clock today, the President, O. B. HADWEN, in the chair.

A report was received from the Committee on Plants, nominating Arthur H. Fewkes for Chairman, and Robert Melrose Grey to fill the vacancy on the Committee, and these gentlemen were unanimously elected.

The Secretary announced the receipt of a letter from Professor L. Wittmack, Secretary of the Royal Prussian Horticultural Society, Berlin, acknowledging his election as a Corresponding Member of this Society, and thanking the Society therefor; also a letter from Ralph D. Cleveland of Hinsdale, Illinois, acknowledging with thanks the expression by the Society of respect and esteem for his father, the late H. W. S. Cleveland.

The question of holding or omitting the weekly summer exhibitions of the Society was brought up, and after full discussion it

was voted to omit all exhibitions until the Annual Plant and Flower Show on the 4th and 5th of September.

On motion of Henry L. Clapp it was unanimously voted that this Society endorse the object of the Society for the Protection of Native Plants.

William C. Strong stated the arrangements made for the meeting of the American Pomological Society at Buffalo, N. Y., on the 12th and 13th of September, and urged the attendance of as many members as could make it practicable to visit that and the Pan-American Exposition. It was voted that the Secretary receive the names of such members as would attend as delegates, and that he also notify members of the opportunity.

Joseph H. Woodford, from the Committee to prepare a memorial of the late Edwin C. Lewis of Taunton, made a report which was unanimously accepted, and it was voted that it be entered on the records of the Society, and that a copy be sent to the family of Mr. Lewis.

The following is the memorial :—

Whereas, we have learned with great sorrow that our friend and fellow member of our Society, Edwin C. Lewis of Taunton, has been taken away from us by death, we desire to record our deep sense of the loss we have sustained; therefore be it resolved, that in his decease we recognize the passing away of a man of admirable character, whose nature was strongly marked by the qualities of earnestness, sincerity, good faith to his employer, kindliness of soul and geniality of disposition; and be it further resolved, that in his long and successful career as a tiller of the soil he always illustrated the best type of a gardener and farmer, and that the example which he has set of fidelity to his calling is one we may desire to emulate; and be it further resolved, that our heartfelt sympathy be extended to his family and friends, and that a copy of these resolutions be spread on the records of our Society, and be transmitted to his bereaved family.

WARREN H. HEUSTIS,
PATRICK NORTON,
J. H. WOODFORD. } *Committee.*

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

ALBERT L. MURDOCK, of Boston,
LORING UNDERWOOD, of Belmont,
SYLVESTER TOWER, of Boston,
MISS C. M. WALKER, of Boston,
JOSIAH B. SHURTLEFF, JR., of Revere,
MRS. HELEN M. TOWER, of Cambridge,
ALFRED RICHARD CROSS, of Nantasket.

Adjourned to Saturday, August 3.

BUSINESS MEETING.

SATURDAY, August 3, 1901.

An adjourned meeting of the Society was holden today at eleven o'clock, the President, O. B. HADWEN, in the chair.

Agreeably to the Constitution and By-Laws the President appointed the following named members a Committee to nominate candidates for Officers and Standing Committees for the year 1902:

WILLIAM C. STRONG, *Chairman*,

WILLIAM H. SPOONER,	PATRICK NORTON,
FRANCIS H. APPLETON,	BENJAMIN C. CLARK,
BENJAMIN P. WARE,	MRS. E. M. GILL.

The Secretary read a letter from N. L. Britton, Ph. D., Chairman of the Council of the Horticultural Society of New York, inviting this Society to participate in an International Conference on Plant Breeding and Hybridization during the year 1902, probably during the month of September. It was voted to accept the invitation.

The Secretary also read a letter from Mrs. Jane Lewis, thanking the Society, on behalf of herself and her family, for its expression of sympathy in the loss of her husband, the late Edwin C. Lewis.

Adjourned to Saturday, September 7.

Francis H. Appleton, Chairman of the Building Committee, read the draft of an agreement between the Society, and William H. Hill, R. Stuart Chase, and Charles H. W. Foster, Trustees under the will of William H. Hill, and offered the following vote:

Voted, To authorize the Treasurer of the Massachusetts Horticultural Society to execute in the name of the Society an agreement between it and William H. Hill, R. Stuart Chase, and Charles H. W. Foster, Trustees under the will of William H. Hill, in regard to the use and maintenance of the passageway created for the benefit of the estates of the two parties to the agreement and to cause the corporate seal of the Society to be affixed thereto.

The passage of this vote was moved by Ex-President William C. Strong, and seconded by William H. Spooner, and after full consideration it was passed by a unanimous vote in the affirmative.

The Chairman of the Building Committee then read the report of that Committee, and presented the following vote and moved its passage:

Voted, That the Society accepts the new building on Massachusetts Avenue, with the provision that the contractor shall not be given formal acceptance until the Society's interests can be fully protected.

This motion was seconded by William H. Spooner and discussed by Mr. Strong, Mr. Spooner, and the President of the Society, inquiries being answered by the Chairman of the Building Committee, and carried in the affirmative.

The meeting was then dissolved.

BUSINESS MEETING.

SATURDAY, October 5, 1901.

A Stated Meeting of the Society, being the Annual Meeting for the choice of Officers and Standing Committees, was held * at eleven o'clock today, the President, O. B. HADWEN, in the chair.

The Secretary stated that the notice of this meeting required by the Constitution and By-Laws had been duly given.

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* At Wesleyan Hall, Bromfield Street.—Ed.

On motion of Edwin H. Jose, duly seconded, it was voted that the Report of the Committee on the Revision of the Constitution and By-Laws, presented at the Stated Meeting on the fifth of January and then postponed to this meeting, be taken up.

Theodore H. Tyndale moved that the Committee on the Revision of the Constitution and By-Laws be discharged, and that the consideration of their Report be indefinitely postponed. This motion was duly seconded and carried.

Joseph H. Woodford moved the reconsideration of the last vote. This motion was duly seconded and reconsideration was refused.

The President here retired and called to the chair Vice-President Benjamin P. Ware.

Ex-President William C. Strong reported from the Executive Committee a recommendation that the opening of the New Hall be celebrated by an address or addresses during the coming Chrysanthemum Show. The report was accepted, and the President and Ex-Presidents Strong and Spooner were appointed a Committee to make arrangements for the celebration.

The President, as Chairman of the Executive Committee, presented a report from that Committee, recommending the appropriation of $6,000 to cover the deficiency in the amount previously appropriated for the Building Committee. This appropriation was voted.

Agreeably to the Constitution and By-Laws the Chair appointed Hon. Aaron Low, Charles W. Jenks, and Edwin A. Hall, a Committee to receive, assort and count the votes given for Officers and Standing Committees for the year 1902, and report the number. The polls were opened at a quarter past eleven o'clock.

Charles E. Richardson, Treasurer, moved the following vote:

Voted, That the Treasurer be, and he hereby is, authorized to execute, in the name of the Massachusetts Horticultural Society, an agreement between it and William H. Hill, R. Stuart Chase and Charles H. W. Foster, Trustees under the will of William H. Hill, in regard to the use and maintenance of the passageway created for the benefit of the two parties to this agreement, and to cause the corporate seal of the Society to be affixed thereto.

The vote was passed in the affirmative.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were on ballot duly elected:

HENRY BIGELOW WILLIAMS, of Boston,
MISS ELLA F. HILDRETH, of Lowell,
MISS MARY ALMA COE, of Boston.

The polls were closed at quarter past one o'clock, and the Committee to receive, assort and count the votes given, and report their number, reported that the whole number of ballots cast was ninety-one, and that the persons named on the ticket presented by the Nominating Committee had a plurality of votes and were elected, except that Arthur F. Estabrook was elected a member of the Finance Committee in place of Charles S. Sargent.

The report was accepted, and the persons reported by the Committee as elected were, agreeably to the Constitution and By-Laws, declared by the presiding officer to have a plurality of votes, and to be elected Officers and Standing Committees of the Society for the year 1902.

Adjourned to Saturday, November 2.

BUSINESS MEETING.

SATURDAY, November 2, 1901.

An adjourned meeting of the Society was holden at eleven o'clock today, the President, O. B. HADWEN, in the chair.

The President, as Chairman of the Executive Committee, reported from that Committee a recommendation that the Society appropriate the following named sums for Prizes for the year 1902:

For Plants	$1,750.00
" Flowers	2,187.00
" Native Plants	153.00
" Fruits	1,487.00
" Vegetables	1,050.00
" Gardens	438.00
Total	$7,065.00

These amounts being twelve and one-half per cent less * than those appropriated for the year 1901.

The President further reported from the same Committee a recommendation that the Society appropriate $250 for the Committee on Lectures and Publication for the year 1902, this sum to include the income of $50 from the John Lewis Russell Fund.

The report was accepted, and, agreeably to the Constitution and By-Laws, laid over until the Stated Meeting on the first Saturday in January.

It was voted that any further furnishing of the Library Room, with either bookcases or other furniture, be entrusted to the Library Committee.

On motion of Ex-President William H. Spooner it was voted that the Building Committee be requested to furnish a detailed statement of the cost of the new building.

GRENVILLE T. W. BRAMAN of North Cohasset, having been recommended by the Executive Committee for membership in the Society, was on ballot duly elected.

Adjourned to Saturday, December 7.

BUSINESS MEETING.

SATURDAY, December 7, 1901.

An adjourned meeting of the Society was holden at eleven o'clock today, the President, O. B. HADWEN, in the chair.

In the absence of the Secretary by reason of illness, Miss Charlotte M. Endicott was appointed Secretary *pro tem.*

Warren H. Heustis, Chairman of the Committee on Vegetables, read the Annual Report of that Committee.

The report of J. Woodward Manning, as Chairman of the Committee on Flowers, was read by the Secretary *pro tem.*

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*This reduction was later restored on recommendation of the Executive Committee, making the appropriation for 1902, $8,075.—Ed.

Arthur H. Fewkes, Chairman of the Committee on Plants, read the Annual Report of that Committee.

William E. Endicott, Chairman of the Committee on the Library, read the Annual Report of that Committee.

These reports were severally accepted and referred to the Committee on Publication.

The Schedule of Prizes for the year 1902 was reported by William H. Elliott, Chairman of the Committee on Establishing Prizes, accepted, and referred to the Committee on Publication. A printed statement of the changes from the Schedule of 1901 was also presented.

William H. Spooner moved that when the meeting adjourned it should be for two weeks, in order that Committees which had not yet presented their reports be given further opportunity in which to read them. This motion was carried.

Patrick Norton, Chairman of the Committee on Gardens, announced that the report of that Committee would be presented at the next meeting.

William C. Strong presented the following memorial of Thomas Meehan:

It is with deep regret that the Massachusetts Horticultural Society learns of the death of Thomas Meehan, of Philadelphia, on the 19th of November last. For nearly half a century our members have had constant fellowship with him in the various departments of horticulture in which he distinguished himself. He first became known to us as a nurseryman, the late William Saunders being his partner, until his transfer by the United States Government.

Subsequently Mr. Meehan was the sole proprietor of one of the most varied and extensive nurseries in the United States, bringing his sons into training in the latter years of his life.

In addition to the vast amount of care involved in this enterprise he early took upon himself the founding of the "Gardener's Monthly," which he edited and published with signal ability for twenty-nine years, it being the leading periodical for nurserymen and gardeners. After the multiplication of periodicals devoted to the florists' and nurserymen's trade, Mr. Meehan changed the character of his Monthly, making it eminent in illustrations of native plants, in botanical descriptions, and in notes in the varied departments of landscape and horticulture.

In the midst of the enormous demands of these business enterprises, Mr. Meehan found time to gratify his love and his genius for botanical research and he attained such proficiency that he became the valued correspondent of the late Professor Asa Gray and other experts in this country and in Europe. He was elected a Corresponding Member of this Society in 1869.

His mind was surprisingly alert to discover the secrets of nature, and to reveal the infinite wisdom of the Creator.

And to all this multiplicity of labor he yet added eminent service as a good citizen, jealously guarding the interests of the great city of Philadelphia for many years with signal skill and credit. The parks of that city bear witness to his wisdom. To few men have been given the privilege and the high honor of doing so much for the welfare of his fellowmen. We honor his memory; we mourn his loss.

To the family of the deceased we extend our sincere sympathy, while we congratulate them upon the rich inheritance they have received in his noble and honored life.

It was voted that this memorial be accepted and adopted.

On motion of William H. Spooner it was voted that the Society tender the use of its halls to the State Board of Agriculture on the occasion of its Semi-Centennial next July.

On motion of William C. Strong it was voted that the Committee of Arrangements be instructed that exhibitions which are open on Sunday shall be free on that day.

CHARLES SCULLY of Norwell,

having been recommended by the Executive Committee for membership in the Society, was on ballot duly elected.

Adjourned to Saturday, December 21.

BUSINESS MEETING.

SATURDAY, December 21, 1901.

An adjourned meeting of the Society was holden today at eleven o'clock, the President, O. B. HADWEN, in the chair.

E. W. Wood, Chairman of the Fruit Committee, read the Annual Report of that Committee, which was accepted and referred to the Committee on Publication.

Patrick Norton, Chairman of the Committee on Gardens, said that the report of that Committee was not ready but would certainly be at the January meeting and that the amount appropriated for that Committee was $500, of which $420 was awarded.

Further time was granted the Committee to prepare their report.

It was voted that reports of Committees not yet ready go over to the January meeting, and that the Secretary notify the Chairmen of such Committees to have them ready at that time.

J. Woodward Manning, Chairman of the Committee on Flowers, said that the Committee had under consideration the award of the Prospective Prize, which might increase the amount awarded by $30. He added that the amounts offered for Prizes for Flowers had not for two or three years exceeded the amount offered. This year the amount offered was $300 less than the amount appropriated.

It was voted that the offer in the Schedule of Prizes for Timber Trees be changed to correspond to the law of the Commonwealth requiring this prize to be offered.

Robert Manning read his Annual Report as Secretary and Librarian. The statement therein as to the insufficient width of the shelves provided by the Building Committee led to some remarks on that subject by Ex-Presidents William C. Strong and William H. Spooner, and William E. Endicott, Chairman of the Library Committee. It was finally left to the Library Committee to consider and report what changes are in their opinion necessary in the Library Room, with an estimate of their cost.

The subject of charging an admission fee on Sunday to such exhibitions as are kept open on that day was discussed, as also its legality, but no action was taken.

The meeting was then dissolved.

REPORT

OF THE

OPENING FLOWER SHOW.

HELD UNDER THE AUSPICES OF THE BUILDING COMMITTEE

JUNE 3-13, 1901.

By GEN'L FRANCIS H. APPLETON, CHAIRMAN.

Upon request, and in order to record in the Society's Transactions some account of the Flower Show of June, 1901, the undersigned has undertaken to do so by a few preliminary remarks followed by quotations from published articles which seem to him to be appropriate.

No attempt is made to catalogue the many plants there shown, as the press reports of that time furnished good records of the Show. It was originally intended that the Flower Show at Horticultural Hall should open on May 29, 1901, but the cold storm of the 19th having delayed the blossoming of many of the rarest flowers which were to be a part of the Show, it was found necessary to postpone that date to June 3 and close on the 13th, which was a continuance of a few days beyond the time originally selected. It was thought that so choice a display ought to be prolonged, and the owners of the many specimens kindly assented.

It is not possible to fully appreciate the amount of work accomplished by Professor Sargent, who planned the disposition of the exhibits and into whose care the owners so loyally placed such a vast number of valuable specimens, in their readiness to co-operate in promoting knowledge of a high standard of horticulture. From the time when Professor Sargent undertook to direct the future Show, until the hour when the last plant was safely in the

keeping of its owners, he was untiring in the efforts which resulted in so great a success.

The upper stories of the new Horticultural Hall had not been completed when the Flower Show of June 3–13, 1901, was opened, the Library being dedicated with due ceremony on November 9, following.

The Flower Show was not an exhibition where competition took place nor one at which money and medals were to be distributed, but was a great exhibit of what the wealth of capital in money and intelligence with loyal public spirit can do to promote interest in horticulture, and give a vast amount of pleasurable education to the people of Boston and those of other cities and towns in Massachusetts.

This Show was as choice in its line as has ever been within our reach or possibility. The lecture hall had then a floor of rough boards; the grand exhibition hall had an earth floor artistically divided by gravel walks into large beds in which exhibits were made with superb color effects. The small hall had its cement floor with facilities for quick drainage of the surplus water used for the orchids. The total effect in each hall and in the approaches thereto was superb.

The question of opening the Show on Sunday was before the management and was considered broadly and with great care. In order that all should have full opportunity to examine and study the plants and flowers it was decided to keep the show open at appropriate hours on Sunday at reduced rates.

The hours selected for opening and closing were 10 A.M. to 10 P.M. on week days and 1 P.M. to 10 P.M. on Sundays.

Favorable opportunities for visiting the exhibition, under suitable rules and at nominal rates, were extended to the school children of Boston and neighboring cities, as well as to the national conference of the Young Men's Christian Association then in session in Boston.

The electric light, telephone, and street railway officials gave us their aid in rearranging their street wires and in completing the out of door surroundings to our advantage as far as possible. To the Police Commissioners we are indebted for courteous co-operation and assistance.

While the Society gave the free use of the halls, the manage-

ment of the Show was held responsible for the financial results. Of the current expenditures on account of the Show, about one thousand dollars' worth of property was left in the possession of the Society as permanent additions to its plant.

A notable feature of the occasion was the day when that distinguished horticulturist, the constant friend and supporter of horticulture, Mr. H. Hollis Hunnewell, recovering from a severe illness, came from his estate in Wellesley to inspect and enjoy the Show.

The photograph then taken, which represents him in company with Mr. Sargent, sitting in the grand hall surrounded by the rare and beautiful specimens from his own and other estates, should be enlarged and preserved in our halls.

The Press of Boston and throughout Massachusetts came loyally to our aid in making known to the citizens of our Commonwealth, that choice types of horticulture were to be displayed in the new halls for their enjoyment, and much writing was done to promote the knowledge of what the Show would be, and to further its success.

The display made was evidently highly appreciated and most beneficial from an educational standpoint. The absence of competition for prizes was looked upon by many as a commendable feature, and the quality and quantity of the exhibition was certainly not lowered by its absence.

The awards that came from words of high praise in the Press were indeed Certificates of Merit that must have been highly prized by exhibitors. The modern method now being adopted by some associations and societies, of extending encouragement in the form of Certificates of Merit for marked excellence, should be carefully considered as to its promotive value.

For the real report of this June Flower Show I prefer to take the ex-parte statements of the Boston Press and select the following description of the exhibition from the Boston Transcript of June 4, 1901.

In the history of American horticulture the opening exhibition of the Massachusetts Horticultural Society in its new hall on the corner of Massachusetts and Huntington Avenues, now in progress, marks the highest point yet reached in floral displays in this country. The exhibition opened last evening at eight o'clock and all the evening the hall was thronged with flower lovers. There was no diminution in the attendance

this morning and half an hour after the exhibition was opened, at ten o'clock, there was a crowd that occupied all the aisles of the three flower-filled halls.

Entering the spacious vestibule, with its tiled ceilings, the visitor to the show turns to the right and enters the lecture hall. The eye is caught first by a splendid collection of wistarias of the purple variety, from the greenhouses of Professor Charles S. Sargent of Brookline, who has been the moving genius of the exhibition, and to whom is due the credit for the arrangement and plan of the exhibition. These are on the left artistically grouped, and on the right are long benches of gloxinias interspersed with adiantum farleyense to hide the pots, and forming a bewildering and kaleidoscopic group of colors.

Three white wistaria plants are ranged above this exhibit, and on the Huntington Avenue side of the hall is a bench of pelargoniums in rich bloom. The gloxinias are from the Sargent, Hunnewell, and Sprague estates and the pelargoniums are from the Hunnewell and Weld greenhouses. On the stage at the end of the hall is the finest specimen in America of the palm known as licuala granda from the estate of H. H. Hunnewell in Wellesley. On either side of this are graceful palms of the areca lutescens variety, and with a bank of amaryllis and lilium longiflorum, the effect is superb. In either corner of this hall are magnificent bay trees from the Italian gardens of Mrs. Charles F. Sprague of Brookline, the pots being masked by beautiful hydrangeas of immense size from the Sargent estate.

In the loggia between this hall and the main exhibition hall are arranged several plants of the rhyncospermum jasminoides, commonly miscalled jasmine, and bearing thousands of delicate white blossoms between their shiny green leaves. The effect of the view of the main hall from this point cannot be surpassed. It is one glorious blaze of color.

The plants which are used here are azaleas, rhododendrons and palms, and these have been arranged with the highest art by Professor Sargent assisted by Miss Beatrix Jones, the landscape gardener, so that they appear as if growing in a garden. At the right from this vantage point is seen a bank of Indian azaleas of the white and pink varieties, with here and there a sport showing in the snow-white bloom. On the left are the red and rose varieties of azaleas massed to show to the best advantage with borders of turf to complete the garden effect. Some of these plants are thirty years old and show the effect of the highest cultivation.

In the centre of the hall with pots sunken below the level of the turf are thirty-three splendid azaleas, one of the finest being a rose variety known as Marie Verschaffelt. The azaleas are from the private greenhouses of Professor Sargent. At the end of this hall is a splendid bank of rhododendrons from the Hunnewell estate, where rhododendron culture has been carried to the highest point reached in this country. All around the hall is a background of palms from the Ames, Sargent, and Hunnewell estates. The orchid collection which is in the small hall leading off from the main hall is the best ever gathered in America and conveys some

ideas of the richness of the private greenhouses in Boston and its vicinity. The largest exhibitor is Mrs. F. L. Ames of North Easton and others who have contributed are E. V. R. Thayer of South Lancaster, W. P. Winsor of Fairhaven, J. S. Bailey of West Roxbury, H. H. Hunnewell of Wellesley, Mrs. C. F. Sprague, J. E. Rothwell and Dr. C. G. Weld of Brookline. They were arranged with the highest of artistic skill by W. N. Craig the gardener of the Ames estate . . . There are in this hall about a thousand orchids including many rare and choice varieties. Of the cypripediums there are fifty varieties and there are about three hundred cattleyas. . . . In addition to the orchids more than a thousand adiantums and five hundred palms ranging from a few inches to fifteen feet in height have been used for decoration.

During the Show the Boston Cadet Band furnished excellent music afternoons and evenings which attracted people who might not otherwise have derived pleasure and profit from this wonderful combination of the horticulturists' skill.

DEDICATION OF THE NEW BUILDING

OF THE

MASSACHUSETTS HORTICULTURAL SOCIETY.*

On the morning of the ninth of November, 1901, the new building of the Massachusetts Horticultural Society on Massachusetts Avenue was formally dedicated. The exercises were held in its spacious library. The annual Chrysanthemum Exhibition was in progress in the Exhibition halls and its brilliant display had attracted a large number of interested spectators.

Vice-President Benjamin P. Ware called the assembly to order and announced that, owing to the sudden death of the President's wife, Mr. Hadwen could not be present; his absence to be regretted in any case was far more so today.

He said that on this occasion when the Society is holding such an important show, marking a milestone in its annals, it should recognize the relation that the Society's work bears to the work of the divine Creator. The God-given talent of cultivation has resulted in a development of flowers infinitely superior to the products of unaided nature. The same has been true in all other lines of our work.

Mr. Ware then called upon Rev. Edward Everett Hale for prayer as especially appropriate to the dedication of such a temple.

Dr. Hale in an earnest prayer invoked the divine blessing upon the work of the Society and dedicated this temple of horticulture to the Creator of all life.

Mr. Ware said that this is the fourth home of the Society, marking a great transition from its first home, a room on North Market Street. The value of having a home where the books of the library, which could not be replaced, can be safely stored is

* With the exception of the Addresses of President Hadwen and Ex-President Appleton this chapter has been compiled from the very full descriptions of the dedicatory exercises published in the Boston Transcript, the Boston Globe and the Boston Herald of November 9, 1901.—Ed.

inestimable. The progress of horticulture can best be demonstrated by looking at the splendid exhibit in the halls below, an exhibition which has never been surpassed in this State.

Hon. James L. Myers, Speaker of the Massachusetts House of Representatives was then called upon. He said that an exhibition such as this was one of the timekeepers of human progress, as President McKinley said of the Exposition at Buffalo, and then read from the Blue Book of 1829 showing the granting of a charter to the Society.

He spoke of the annual exhibitions as successive steps of progress and remarked upon the great benefits that all classes of people have derived from the work of this Society, and expressed a belief in the great measure of influence and usefulness that would go out from this hall and this library in the years before us. On behalf of the State he extended his earnest and warm congratulations.

A letter from Congressman Wm. H. Moody regretting that on account of a previous engagement, he could not be present to represent the nation was read, but Mr. Ware said that there was present a gentleman who represented the cause of humanity everywhere and called upon the Rev. Edward Everett Hale.

Dr. Hale made as usual a felicitous address. He said that if he should say all he felt like saying most of his hearers would wish they had brought a luncheon.

He then told of the work done by hundreds of children in Genesee Street at the South End, and how eager the people were to get the window-boxes that were provided, and how, when fall came and the gardens died, planting bulbs for spring was thought of.

He said that he wrote to the Department of Agriculture in Washington stating that he appreciated the work they were doing in North Dakota and Idaho and Nevada, but he wanted to know what they proposed to do for the benefit of agriculture in Genesee Street and then he told them what bulbs he wanted and he got them and the children up in that street are planting them today.

He wished to emphasize the necessity of being in the open air, a doctrine which he had preached at all times and which he should always go on talking about. It is one of the cardinal rules of good living.

Mr. Ware then introduced General Francis H. Appleton who made the principal address of the day, speaking as follows:

MASSACHUSETTS HORTICULTURAL SOCIETY: HISTORY OF THE SEED SOWN EARLY FROM WHICH THE MASSACHUSETTS HORTICULTURAL SOCIETY HAS DEVELOPED.

Mr. President, Members and Guests:

The date of origin of the Massachusetts Horticultural Society may be given as February 24, 1829, that being the day when the first formal action was had at a meeting of prominent horticulturists of Boston and vicinity. Measures were then taken looking to a permanent organization, and an adjournment was made to March 17, ensuing, when a constitution and by-laws were adopted and complete organization was affected by choice of a board of officers.

This was not a result suddenly arrived at; it might be said that many preliminary meetings extending through years had led up to it. Among the acts or events which may be described as preliminaries — though, indeed, not so intended — were the establishment and maintenance, during the preceding period of twenty-five years or more, as a matter of individual enterprise on the part of citizens in eastern Massachusetts, of numerous fine gardens of fruits and flowers. A like-mindedness in taste and enterprise would certainly be promotive among such of a degree of fraternization, active and cordial as proximity or opportunity might permit, and leading very easily though gradually to organization and coöperation.

Indeed, some note of preparation may be found in the records of horticultural endeavor in the earliest periods—those of the colony and the province and these manifestations became more frequent and more elaborated during the years of prosperity following upon the establishment on firm foundations of the government of the Union after the war of the Revolution had ceased.

The distinction *now* made and emphasized between the affairs or the products of agriculture and horticulture was not recognized by the former generations. All was considered under the

head of agriculture. Even at this day, in the administration of the government at Washington, all matters relating to the tilling of the surface of Mother Earth are classed as agriculture, and the department of bureaus and divisions which comprises those interests in which our society is concerned is officially called the Department of Agriculture.

Governor Winthrop, at Ten Hills farm in Charlestown and Governor Endicott at Salem, were extensive growers of young fruit trees and dealt in them as commodities, supplying their neighbors and fellow colonists; and Governor Prince of Plymouth Colony in an humbler way but in some fashion, seems to have been a promoter of horticulture there. It cannot be doubted that the doings of these Governors proved exemplary and called out not merely praise but imitation.

Of gardens which can be characterized as of fame but few are mentioned by the writers of these early times. It may be permissible, however, to refer to two, of which this may be said, that the respective situation of each was, probably, in sight from the point where we are now assembled.

One was the earliest of which Massachusetts has any record, the garden of William Blackstone on the westerly slope of Beacon Hill. On his departure for Rhode Island he was sufficiently paid for his garden by the local authorities, and, as money was a matter of high consideration in those times, we may well believe that his successors in the ownership and control of the garden, whom he called the "Lord Brethren," carefully fostered and preserved it.

In Governor Winthrop's day a garden was set apart for him and his successors by the General Court on one of the upper islands of the harbor, which then had the name bestowed upon it of "Governor's Garden." The name has come down to these times as "Governor's Island." It was proposed to have a vineyard and an orchard there, the product, in part, to go towards the Governor's salary.

At first a hogshead of wine was specified, but the grapes probably failed in that bleak situation, and, in the year 1640 the rent or what perhaps may be called the "royalty," was reduced to two bushels of apples, one for the Governor and one for the General Court.

Among the orders adopted in England by the Massachusetts Company, in anticipation of the migration hither, was one to provide English seeds, roots and plants for the proposed settlement. In the list of fruits appear the peach, plum, cherry, pear, apple, and quince; also currant plants.

The evidences are many that during the Provincial as distinct from the Colonial period Massachusetts communities made notable advances upon the achievements of their predecessors in the line of horticulture. Still it cannot be said that horticulture was a characteristic of the out-door industry of that day. Only the wealthy or more prosperous citizens had gardens of fruits and flowers. The general yield of the soil was specifically agricultural.

But we have mention of beautiful gardens in Boston and other populous centres. Would that there had been Kodaks in those early days to depict for us those early gardens. The eastern slope of Cotton or Pemberton Hill fronting on what we know as Tremont Row and Tremont Street north of Beacon Street, was to a very considerable extent terraced, and the successive levels of arable land were stocked with choice fruits and flowers.

Andrew Faneuil and his nephew and successor, the famous Peter Faneuil, owned and occupied one of the most celebrated of these estates. Its location was about opposite to the King's Chapel burial ground. The late Lucius M. Sargent, who had probably better information about the matter than any modern man, described the estate as "Faneuil's seven-acre Eden." The next estate was that of Governor Bellingham, and others of similar planning and adornment were farther to the northward along the slope.

Thomas Hancock, the uncle of the patriot and first Governor under the Constitution, appears to have had two slopes thus terraced and made luxuriant,—one on the south, near the Hancock mansion and overlooking the Common, and one on the north, covering, in part, territory known to us as upper Hancock Street and the State-House-extension lot.

Without doubt these numerous demonstrations of the horticultural art served both as instruction and incentive to others.

Horticulturists of the patriotic order who remained on their estates could have found but small opportunity under the conditions

prevailing in the ensuing ten or fifteen years, from the commencement of the Revolution, to gratify such tastes for horticulture.

But, as already intimated, the establishment of the new government on a solid basis brought about a revival. Cultivators of the soil throughout all the States took on new hope and enthusiasm, the chief men of the several communities leading the way. While the order of the Cincinnati established during this period encountered some opposition and criticism, the example of the old Roman, from whom the order derived its name, was very generally followed.

Washington, first in peace as in war, may be said to have been an early pioneer in this movement. The records of his diary and his correspondence show his personal activity in the way both of agriculture and horticulture. While the crops of tobacco, of maize, of cereals and roots of various sorts were diligently attended to, he found time to plant not only fruit trees but ornamental trees on his homestead premises. He surveyed, or caused to be surveyed, the grounds about the mansion, and designated on the plan thus produced the spot where certain trees or shrubs were to be set. He imported choice vines and trees from Europe.

He writes to a friend during these activities, expressing hope of a visit at a future day, and says that he will greet him under the shade of trees which his own hands have planted.

In these records we may read of exotic shrubs; of the planting of elm, maple, hemlock and ash trees along winding paths; of planting holly bushes and sowing holly berries in drills; of a green-briar hedge; of lilacs and honeysuckles; and also, in the same general scheme, we are informed of grapevines, crabapple trees and mulberry trees. What more beautiful spot than his ancient homestead's site at Mt. Vernon.

The second President of the United States, John Adams, during his term as Vice-President, became one of the founders of the system of agricultural societies in 1792, and throughout his long life never ceased from his enthusiasm for agriculture and horticulture.

And the third President, Thomas Jefferson, was an endless experimenter in these lines. Had he never gained international fame as a statesman and publicist, he would have gained it as

practitioner in farming and horticulture, and as inventor of appliances used in those arts.

The details need not be traced, for it will suffice to say that the impetus thus originating in the latter part of the 18th Century did not cease to be effective during the first quarter of the 19th, and that, in this condition of things, as the year 1829 was approaching, the formation of the Massachusetts Horticultural Society became an affair not so much, perhaps, of strenuous endeavor as of normal and timely evolution.

If what has thus been suggested may be regarded as remotely preliminary to the formation of the Society, certain circumstances, familiar enough to those who have scanned the official publications of the Society, may again be cited for the information of others, as being more directly and immediately preliminary.

In the year 1793 the first number of a magazine devoted to agriculture was issued in Massachusetts, which also had much bearing on horticulture. It was entitled the "Agricultural Repository." It continued periodically to appear until 1822, when a similar periodical was established by Thomas Green Fessenden, called "The New England Farmer." The field was cheerfully yielded to the new magazine by the publishers of the "Repository." The new periodical gave somewhat more space to matters horticultural, and, in the year 1828, the title was enlarged by adding the words "and Horticultural Journal."

In November, 1826, Joseph R. Newell, who had previously kept an agricultural warehouse elsewhere, removed to 52 North Market Street. In January, 1827, the office of the "Farmer" was established in the same building, on the second floor, where John B. Russell, then the publisher of the "Farmer," opened a seed-store.

The close combination of the "Farmer" office and the seed-store with the agricultural warehouse attracted agriculturists and horticulturists from all parts of the country; so that the office of the "Farmer" became an exchange for the discussion of all matters of interest to cultivators.

It was here that the subject of forming a horticultural society was discussed and when such a society was formed the "Farmer" naturally became its organ, when needed, and continued to be as long as the "Farmer" existed, that is, till the year 1846.

But the most immediate preliminary to the formation of the society was what may be styled a call and a response on the part of two citizens of reputation in a literary as well as horticultural way.

On January 9, 1829, a communication from Zebedee Cook, Jr. was printed in the "Farmer." It affirmed in quite eloquent terms the merit and utility of the horticultural art and called the attention of the practical horticulturists of the community "towards the founding of a Society for the promotion of that useful employment, of extending its blessings, and increasing the efforts of those who feel an interest in such pursuits."

The editor, Mr. Fessenden, cordially commended this appeal, and, in so doing, declared that "a Society for the promotion of skilful and scientific horticulture, established in Boston, would greatly subserve the interests of the community, as well as furnish avenues to laudable distinction and pure and praiseworthy enjoyment to the members of such an institution."

In the issue of the "Farmer" of the evening February 20th, an invitation, or "request," appeared addressed to such gentlemen as felt favorably disposed towards the institution of a Horticultural Society, to meet on February 24, at noon, at the insurance office of Zebedee Cook, Jr., for the purpose of taking preliminary measures thereto."

The record goes on to say that "although the day was bitterly cold, and a remarkable snow storm had just filled the streets to a depth of five or six feet, sixteen gentlemen appeared at the meeting."

The place of meeting was on Congress Street, No. 7½, or five doors southward from State Street. The insurance office bore that number, and the records of the board of assessors show that the location must have been what would now be described as the south-easterly corner of Worthington Building.

General H. A. S. Dearborn called the meeting to order and made fitting introductory remarks. The Hon. John Lowell presided and Zebedee Cook, Jr., was Secretary. Messrs. Dearborn and Cook, together with Samuel Downer, were made a committee to prepare a constitution and by-laws, and John B. Russell, Enoch Bartlett, Zebedee Cook, Jr., Samuel Downer and Cheever Newhall were associated as a committee to procure subscribers

to membership. The meeting was then adjourned to assemble at the same place on March 17, and then a constitution and by-laws were adopted and a permanent board of officers was chosen. General Dearborn was elected the first President of the Society.

The persons whose names are thus fortuitously brought together as being the first mentioned among those who are to be regarded as founders of the Society were representative men. The remainder of the one hundred and sixty subscribers, who were reported at the meeting of March 17, were men of like habits and sympathies.

Zebedee Cook, Jr., was a prosperous business man of the period and owned a fine estate of twenty-five acres, or more, in Dorchester. It was of irregular shape, fronting westerly upon what was then the turnpike road, now Dorchester Avenue, and southerly, with narrow dimensions, on Crescent Avenue. The southerly slope was made to be a triumph of horticulture, flowers and fruits sharing about equally in the honors. Near the front this garden was adorned by a lively brook, arched with grape vines, and in the rear the ground was thrown into terraces, which in the season were made brilliant with flowers. The ascent was crowned at the north with a rocky summit which gained the name of Cook's Hill. Thence a tract of arable land stretched, with ever widening margins and with gradual descent to the salt marshes.

This northerly tract was the farm. Agriculture had full sway here and in the centre was a huge barn for cattle and the storage of crops. Through this farm-tract the parkway called Columbia Road now extends towards South Boston.

The original estate had been split in two to make way for the Dorchester turnpike road, and the mansion house stood upon the westerly side of that road, on a triangular lot.

General Dearborn was the owner and occupant of an estate of eighty acres in Roxbury, near where Huntington Avenue now joins the old Brookline road. The mansion and grounds had been modelled by a preceding owner after some distinguished estate or the like in England.

That some share of this large estate was applied to horticulture is evident by the mention of General Dearborn as an exhibitor of rare fruits and flowers in the earliest exhibitions of the Society,

and by the fact that, on August 13, 1830, he had upon the table of that day's exhibition the first specimens ever shown of Dearborn's seedling pear.

John Lowell was the proprietor of what has been called a baronial estate at Roxbury. It was of extensive area and he had built upon it a stone residence copied from some European structure. The situation was on old Heath and Centre Streets. This estate, like that of Mr. Cook, though at a much later date, was cut in two to make a public way, in this instance not a turnpike road but the Boston and Providence railroad. Of its proper pretensions and just renown in the way of horticulture an opinion may be formed by the fact that the estate in Mr. Lowell's time had upon it five greenhouses.

Samuel Downer had at Dorchester one of the best stocked and best kept horticultural estates in the vicinity of Boston, at the date now referred to, and it held that rank for years afterwards. Its situation was the south-east declivity of "Jones' Hill." Its terraces were numerous and extensive. Fruits, rare in the extreme, were upon this hillside; flowering plants were scattered in settings here and there, and tribes of honey bees, whose hives occupied the level below the terraces, were busy and melodious at their work. On this estate originated the famous Downer cherry.

Enoch Bartlett's estate, in Roxbury, bordering southerly upon the present Dudley Street, northerly upon Magazine Lane and easterly upon Governor Eustis's estate, matched in some respects and surpassed in others that of Downer. The honors appear to have been about even between the two as to choice original fruitage; for on these Roxbury grounds was first produced the incomparable Bartlett pear.

Cheever Newhall owned and cultivated extensive farming tracts in Dorchester, towards one hundred acres in all. His homestead lot was perhaps of twenty-five acres, lying on the northerly side of the present Ashmont Street, and stretching towards Adams Street. Here he had flourishing orchards, principally of pear trees, of which there were several hundred. He was a man of enterprise and public spirit.

It does not appear that Messrs. Fessenden and Russell were men of landed property at the time now in view, but they were ardent champions of horticulture and efficient helpers in that cause.

The membership list of one hundred and sixty reported in March had, by September 10, 1829, increased to two hundred and forty-nine, comprising the names of many of the scientific and opulent citizens of Boston and suburbs, as well as considerable numbers of practical cultivators.

On April 28, 1829, the Society petitioned for an act of incorporation, which was promptly granted by the General Court, and was approved on June 12 by His Excellency Governor Lincoln, himself a practical horticulturist of your own energetic and busy city of Worcester, Mr. President, with its estates and Park land in whose Board I believe you are President.

The room where the meeting for organization of the Society was held, No. 7½ Congress Street, served in like manner for three subsequent meetings. It was convenient in some respects, situated at a central point, Mr. Cook's office being on the first floor. But with the increase of membership more space was needed, and, on June 9, arrangements previously made enabled the Society to hold a meeting in the building on North Market Street already spoken of. Here a place on the third floor had been fitted up, and in the first instance was called "the Society's room," which phrase the secretary improved upon in the next call — of date, June 12 — for a meeting, by giving the room a title as "Horticultural Hall."

The building has never quite lost the particular prestige thus obtained, and is still resorted to with horticultural intent and purpose, being now known as the Messrs. Breck's Agricultural Warerooms, from our distinguished Ex-President Joseph Breck, 1859–1862. Here the Society's earliest exhibitions of flowers were given, charming ones we may well believe, but small if measured by the present standards. The formation of a library, it appears, was also begun here. The situation and the outlook might be deemed, by Bostonians at least, as propitious for a beginning, giving a view of Faneuil Hall at the right hand, Quincy Market building and the market place on the left, and, through the vista of Merchants' Row, a glimpse of State Street.

The routine of things began at once by the display of choice samples weekly on Saturdays, though not during the winter season. The first weekly offering of products took place on June 20, 1829.

The first annual exhibition, on September 19, 1829, was made in the dining hall of the rebuilt famous hotel, known as the Exchange Coffee House. Visitors were admitted from 12 M. to 2 P. M., the members of the Society and guests being the exclusive occupants at 4 P. M., when a banquet was served,—a truly English idea to banquet, surrounded by the especial evidences of the objects for which the association existed. In the interval between the closing of the exhibition and the hour for dining, li erary or oratorical exercises took place in the hall of the Boston Athenæum.

Weekly displays continued to be made, as at first, at the North Market Street hall until May 14, 1831, when rooms were occupied in Joy's Building on Washington Street.

An enterprise, after considerable informal discussion, was entered upon on November 27, 1830, in the appointment of a committee "to inquire into the expediency of purchasing a piece of ground in the vicinity of Boston for a garden of experiment and a rural cemetery." This action culminated in the establishment of Mount Auburn Cemetery. The record of the Society in this matter is familiar and need not be traced in detail here.

The Society's responsible connection with the cemetery ceased on June 19, 1835, that being the date of the deed of conveyance of the premises to the Mount Auburn Corporation.

It appears to have been felt that the improvement of horticulture could be better promoted in other ways for the encouragement of individual efforts in the horticultural art, by the provision of suitable halls for the exhibition of improved products, and by the collection of a horticultural library than by the continuance of a garden.

To the policy of administration thus set forth, the Society has adhered. Liberal rewards have been offered and bestowed; a hall for exhibitions has been maintained; important and superb exhibitions have been made; the library has been steadily increased, both in respect to number of volumes and its intrinsic value and practical utility; quantities of seeds and rare plants have in the past been judiciously distributed; lectures, or public addresses, on horticultural themes have been provided, and much literature relating to the horticultural art and bearing the Society's approval has been issued.

Meetings, or banquets, of the Society have been graced by the presence of distinguished visitors from other states and lands and by men of special note among Massachusetts citizens.

Of the Society's brilliant festivals, the public assembly incident to the exhibition of 1845 could not have been surpassed, if ever equalled. The festival, as distinct from the exhibition, took place in the evening, in Faneuil Hall, which was made to be a scene of luxuriance by evergreen and floral adornment of the pillars and gallery fronts.

The President of the Society, Hon. M. P. Wilder, made the opening address, which was followed by speeches by Hon. Edward Everett, who had that morning arrived in Boston after a five years' residence abroad as minister to England; by Hon. Daniel Webster, who was introduced as "the Marshfield farmer"; by the Hon. J. G. Palfrey, Secretary of the Commonwealth; by Hon. Josiah Quincy, Ex-President of Harvard University; by Hon. R. C. Winthrop, and Hon. Caleb Cushing, who had just returned from his embassy to China. During the evening the venerable widow of Alexander Hamilton (daughter of Gen. Philip Schuyler), who sat on the right of the President, was introduced to the audience by Mr. Webster.

It may be remarked that on one or more occasions the annual exhibition was held in a huge tent on the Common. Besides its own halls in different locations (School Street and Tremont Street), the Society has, at different times, occupied for exhibitions Faneuil Hall, the Federal Street Theatre, Andrews Hall, and, four or five times, Music Hall.

That which I have endeavored to picture to you of the earlier days of this distinguished organization may be called the seed, the example, the incentive to the mighty changes and enormous advances that have followed.

Today, from the western line of Berkshire to the eastern shores of Massachusetts, the surface of our state bears evidence of horticultural activity and beauty in almost every degree of extent, and the advance is still making rapid strides.

In no small degree is our Society responsible for these results; she can well take much to her credit for the enhancing of the condition and beauty of the already fair face of this ancient Commonwealth.

As it is thought of, one is amazed at the improvements. Think only of the landscape beauty upon the many estates of all sizes in what is known as Metropolitan Boston, for example, with a most extensive system of Parks; the superb private estates with gardens; and the glass houses and fields of market produce in Arlington, Belmont, Revere and elsewhere, conducted upon business principles, guided by scientific knowledge, that can be surpassed nowhere else in the world; the markets for the sale of produce from these gardens, and the flower marts in many stores throughout our cities, contain products that vie with or surpass any that elsewhere exist; the knowledge of good road building is now with us, and is being put into practice in a way to be of great benefit; the encouragement of window gardening and school gardens is a most commendable feature of our work that deserves encouragement; and all direct and indirect influence for horticultural good that goes out from the fact of our existence as a Society.

In the long roll of members, past and present, who have been making this honorable record for the Massachusetts Horticultural Society, there are too many for me to recount, and to whom we all bow in respectful recognition. You know them well for their fondness for horticulture and their actual promoting of it. Those who have established the several prize funds, those who have given towards the support of our library, and especially that giver of largest amount in money, call for high recognition.

The many superb products of the soil that have first appeared on our tables and in our Halls to the benefit of the public are too numerous for me to try to recount.

I have, perhaps, taken up too much time and necessarily omitted much, but may your memories fill the gaps with reminiscent, helpful and pleasant thoughts of horticultural activity, progress and success from the time of our incorporation up to today.

We are now in this new Hall of great architectural beauty, designed after visits were made to structures used for like purposes abroad; prepared for horticultural uses in all its parts, and for such other uses as may be judged profitable, while being helpful and promotive to horticulture, without interfering with the duties of the Society. Its library and office floor is indeed

imposing, well lighted and quiet for its purposes; for the housing of its large and increasing, valuable library, which has reached more than ten thousand volumes bound and in pamphlet form. All is spacious. As the Society becomes more wonted to this new home, may its usefulness and honorable position that it has always held continue and advance, while it cares for the charge laid upon its shoulders by the State Government of 1829, at the instigation and by the wording of those earnest early horticulturists to whom I have referred "for the purpose of encouraging and improving the science and practice of Horticulture, and promoting the amelioration of the various species of trees, fruits, plants and vegetables, and the introduction of new species and varieties." Would that those words might be emblazoned on the walls of our Halls for all time, and may our Society always be most firmly united and organized upon the best business principles to uphold them.

I am sure that it has been the endeavor of all their successors in office and in the ranks, to strive to do their duty fully, and at all times, as they could best interpret it.

The great success of this Society has proved the wisdom of its management in the past; and with this building, and its large fund that will belong to it also ever devoted to promoting its aims and united effort for horticultural progress, success must ever be the goal that it will reach.

Let us ever seek to inspire a general and increasing interest in our work among the citizens of the Commonwealth so far as it is possible; may those who are able to make our large exhibitions for display a success by their exhibits, on the lines of instruction, pleasure, general helpfulness, and profit to the Society for other horticultural promotion, ever be ready to place their products within our Halls; and may those who seek recognition of merit and worth in new varieties ever find a continuance of the value to them of the award of merit from this Society, and seek it here.

May funds, from gift or bequest, continue to come to the Society from lovers of horticulture in every possible line for helpfulness, be they for effect either inside or outside of the Great Building.

We have now six hundred and eighty-two Life Members and one hundred and ninety-nine Annual Members — a total of eight

hundred and eighty-one. May people of every line of horticultural earnestness be encouraged to give their support to our good and patriotic cause.

Mr. President, I thank you and the Committee for your courteous invitation to speak upon the occasion, and heartily wish that all possible success from united effort in the Society's work now in progress here may result.

At the conclusion of General Appleton's address Mr. Ware, the presiding officer, declared the building dedicated to the advancement of flowers, fruits and vegetables.

Upon motion of General Appleton an expression of sympathy was sent by telegram to the President of the Society.

Mr. William C. Strong moved and it was voted that the address which President Hadwen had prepared for the occasion be requested and be published with the proceedings of the day.

Address of President Hadwen.

The Massachusetts Horticultural Society has reached a period of seventy-two years of incorporated life, and now approaches the third important epoch in its history, — the dedication of this Horticultural Building in which we are this day assembled, it being the third erected by the Society during its incorporation; and perhaps it may not be egotistical to state that it is without a peer in its arrangements for exhibitions, its magnificent architectural effect, and in its solidity and durability of construction. With its refined environment, having frontage on three streets, it is not only a conspicuous building in Boston, but equal, if not superior, to any Horticultural building in the world.

The Society during its seventy-two years of active existence, eminent in its calling, has achieved a marked success in the practical advancement of horticulture, and has rendered service to the whole country by advancing the art and science of horticultural pursuits. Its progress has been manifest in every known feature. The entire State, with its system of parks and rural embellishments, its highways, its adornment of homes, its increased revenue from horticultural pursuits is largely indebted to this Society, as well as are individuals who have been benefitted by the object lessons of its exhibitions, its library and its lectures during the winter seasons.

Let us hold in grateful remembrance the distinguished benefactors who, for this long period, have contributed their time and their means to insure the progress and prosperity of the Society, and let us encourage the active members now engaged in its wholesome work, both men and women who in the study of fruits, flowers and vegetables have natural and acquired fondness for pursuing the mysterious forces and hidden secrets which nature has always in store, and of which there is seemingly no end.

The silent, but magnificent exhibitions in the Halls denote the best practical demonstration of the progress of Horticulture, in which every season brings something new. Being now in gorgeous display, the flowers and the fruits of the autumn collected from all over the world are increasing the interest in the science of Horticulture in those who behold them; and the intelligence and skill manifested in their cultivation not only educate the faculties, but inspire a love for all that is beautiful and useful.

In the retrospect let us not be unmindful of the past, but ever cherish the work that has been accomplished by those who have preceded us in the great horticultural advancement that has made the Society eminent in encouraging the products of the fields, gardens and forests. These, being the special early objects of the Society, have now reached an importance unequalled by any period of time in the world's history.

DESCRIPTION OF THE NEW BUILDING

OF THE

MASSACHUSETTS HORTICULTURAL SOCIETY.

ERECTED A.D. 1900.

The completion and occupation of the new building of the Massachusetts Horticultural Society on Massachusetts Avenue, Boston, marks the beginning of another era in the history of the Society. For many years the need of enlarged accommodations has been strongly felt, and at various times propositions have been considered looking toward a change of location and providing increased facilities for carrying on the work of the institution.

The present building, it is believed, will furnish such accommodations for many years to come. The Building Committee, under whose supervision it has been erected, consisted of Francis H. Appleton, Charles S. Sargent, William J. Stewart, George A. Nickerson and Charles F. Curtis.

The accompanying plans from the architects' drawings present the general arrangement of the interior of the building while the frontispiece shows a view of the exterior, as seen from the corner of Massachusetts and Huntington Avenues.

The first floor of the building covers an area of 18,066 square feet, and contains the large exhibition hall, a smaller exhibition hall and a lecture hall.

The main hall is reached through a spacious vestibule, but a single step above the level of the sidewalk, and is 52½ feet in width by 123 feet in length, the height being 42 feet, not including the monitor roof.

At the easterly end of this hall is the loggia, a raised platform four and one-half feet above the main exhibition hall. It has an area of 28 by 52 feet, and broad stone steps connect it with the floor of the main hall. From the loggia a commanding view of the exhibitions can be had.

The small exhibition hall is 28 by 57 feet and 28 feet, 6 inches in height.

·BVILDING·FOR·
·MASS·HORTICVLTVRAL·SOCIETY
·MASS·AVENVE·
WHEELWRIGHT + HAVEN ARCHITECTS.
1001 COLONIAL BVILDING BOSTON·

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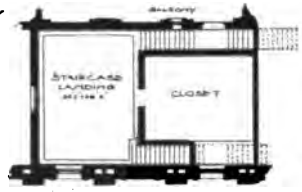
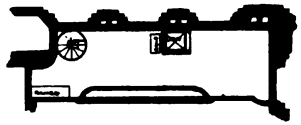
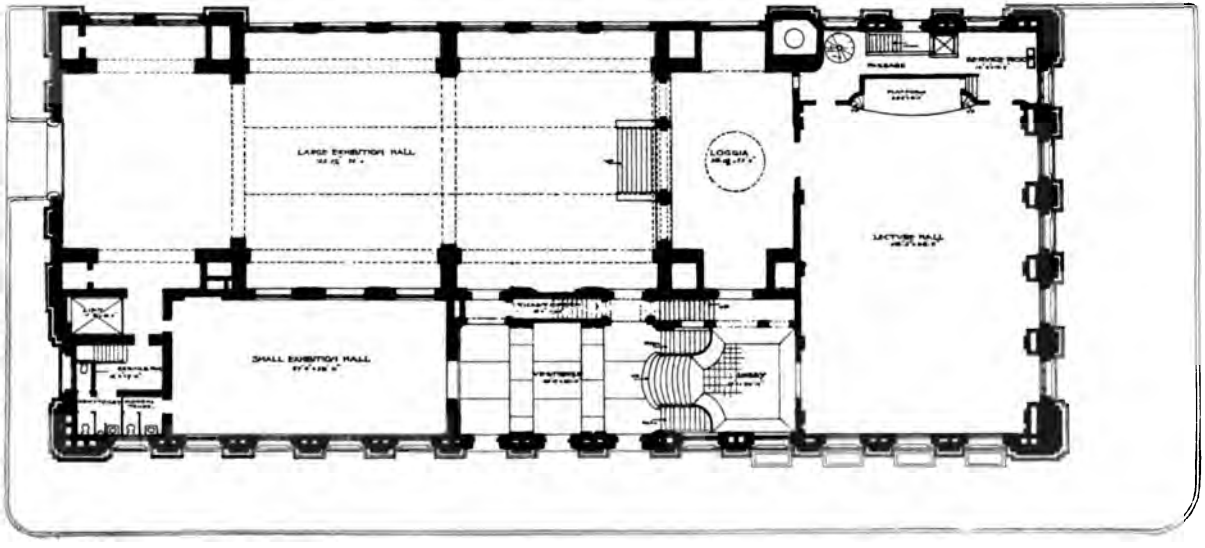


MEZZANINE FLOOR ··· VESTIBULE



MEZZANINE FLOOR ··· PLATFORM + SERVICE R'M.



Plan of the New Building. First Floor.

The lecture hall, which is on a level with the loggia, is at the Huntington Avenue end of the building and has a stud of 25 feet, and its dimensions are 48 by 68 feet.

The basement is devoted to the committee rooms, dressing and waiting rooms and a large banquet hall, the Falmouth Street end being occupied by the heating and electric apparatus with the necessary accessories.

The second floor, which is built around an interior court of 6,511 square feet, contains the spacious library and rooms for the use of the Secretary, Treasurer and committees. There is in addition large storage space for general uses.

The library is well lighted, arranged in alcoves and has a gallery around three sides. Every book is easily accessible without the aid of step-ladders. In design and finish the library is of great architectural beauty, and has ample capacity for at least fifteen years. The space for additional stacks, which the adjacent attics afford, gives room to meet all probable needs of book space that will ever be required.

The height of the building above the grade of the sidewalk to the top of the cornice is 57 feet, and to the top of the roof is 69 feet, 6 inches.

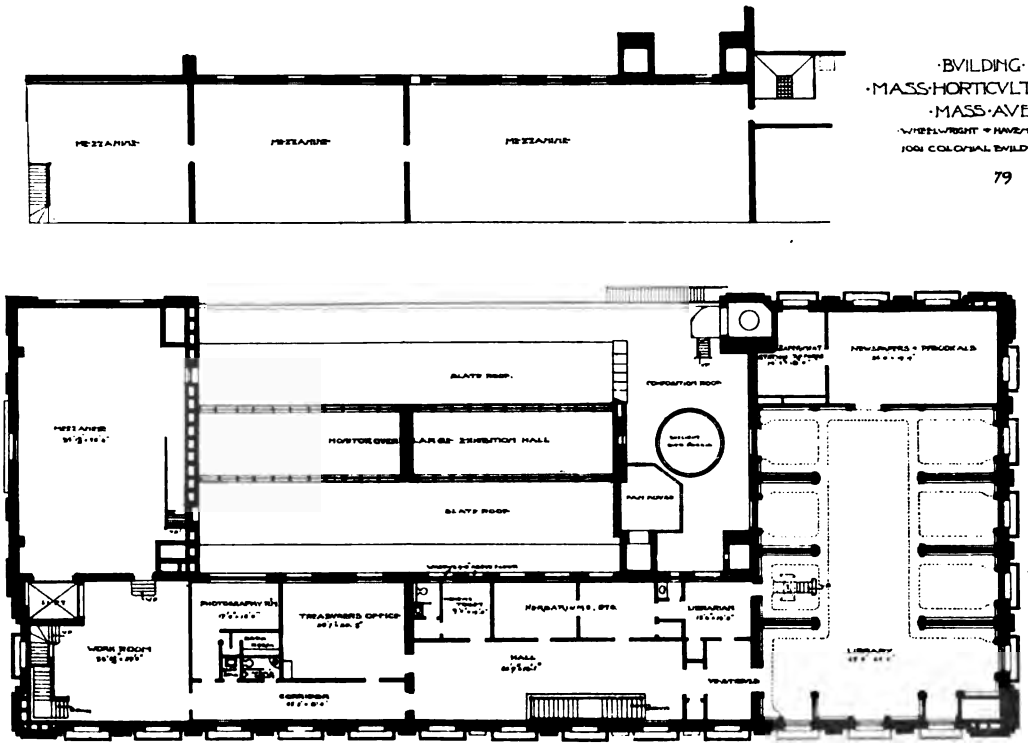
The construction is that of a building of the first class, as required by the building laws of this city, being in its main structure built of incombustible material.

The floors are of guastavino tile and concrete, or the concrete construction of the Eastern Expanded Metal Company.

In the roofs the same methods are employed, except that the roof over the large exhibition hall is composed in part of three-inch plank protected by metal lathing and plaster. The foundation's footings are concrete, widely spread upon the gravel and sand subsoil which was found to be too coarse to permit the economical use of piling.

The base course is of Deer Isle granite. The exterior brick is red, eastern water-struck, face brick, laid Flemish bond and the trimmings are of Bedford limestone.

The cheneau is of terra-cotta, matching the color of the limestone; the frieze panels being of Brescia, Bois d' Orient and Red of Levanto marble. The principal features of the facade are the



Plan of the New Building. Second Floor.

corner piers and the colonnade of brick pilasters supporting an ornamental entablature.

The floor of the entrance lobby is of North River bluestone, and that of the committee rooms in the basement and the small exhibition hall is granolithic.

The lecture hall, loggia and second story rooms have Georgia pine floors, while the large exhibition hall which has a temporary spruce floor, was originally designed to have a gravel floor so that pots of plants might be readily imbedded therein with a garden effect like that of some European horticultural buildings.

The walls of the lobby and small exhibition hall are laid with eastern pressed brick and those of the large exhibition hall and its loggia with eastern water-struck face brick.

The committee rooms in the basement, the lecture hall and the rooms on the second floor, other than the storage room, have plastered walls and ceilings.

The south wall of the storage room on the second floor at the Falmouth Street end, over the large exhibition hall, is supported by a brick arch to avoid the necessity of using steel girders which would have to be covered with metal laths and plaster to conform to the requirements of the building regulations.

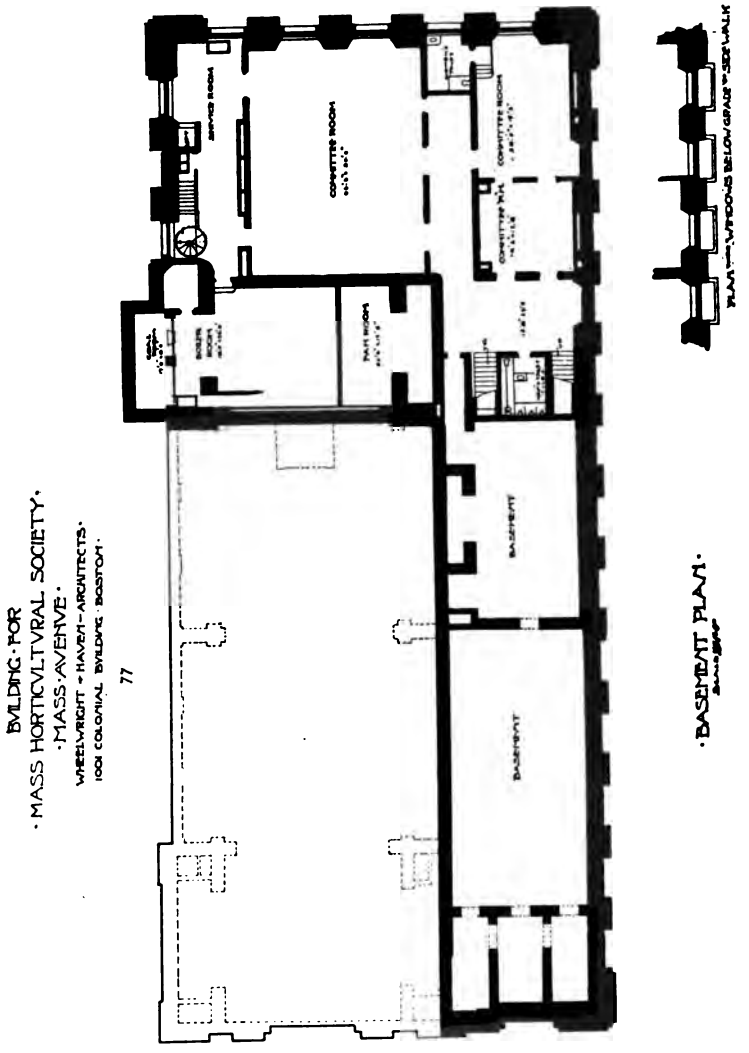
From Falmouth Street a wide and high doorway gives access on the street level to the floor of the large exhibition hall. This facilitates the easy and safe handling of large plants in the flower shows, thereby meeting the needs of the Society in this respect.

The interior finish throughout is selected Georgia pine. A large hand-lift serves the storage rooms on the Falmouth Street side of the building, and an electric lift, the well equipped kitchen over the service room which adjoins the lecture hall.

The heating, ventilation and electric work was carried out under the direction of Hollis French and Allen Hubbard, engineers, and the building was designed and constructed by Wheelwright & Haven, architects.

The cost of the building was $290,997 and that of the land $225,000, making a total of $515,997.

As an architectural work, the new Horticultural Hall is a noteworthy addition to the public buildings of the city, and its new location is destined to become the center of great business and social activities.



Plan of the New Building. Basement

REPORT

OF THE

COMMITTEE ON PLANTS

FOR THE YEAR 1901.

By ARTHUR H. FEWKES, CHAIRMAN.*

Notwithstanding the unsettled conditions under which we have labored the past year, our exhibitions up to the time of leaving the old hall, and since the completion of the new, have been very satisfactory, particularly in the general good quality of the exhibits.

During the early part of the year we were favored, nearly every Saturday, with fine displays of Orchids which were most interesting and instructive. It is gratifying to note the unabated interest shown in exhibiting this class of plants and we look for its continuance.

In May our Committee unfortunately lost its chairman, Mr. Lunt, by resignation, and as an orchid expert his loss to us is keenly felt. In the following report, the part which covers the time up to his resignation, — from January 5th to April 6th — was written by him, the remainder by his successor.

The first exhibits of the year were made on January 5. The display of Primulas on this occasion, while showing improvement over former years, was not up to the standard in the *stellata* group. James E. Rothwell showed *Cypripedium* × *Longwoodense*, a pleasing hybrid between *C. Leeanum* var. *Masreelianum* and *C. Charlesworthii*, which received Honorable Mention. Oakes

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* Elected Chairman July 6th in place of William Wallace Lunt resigned.—Ed.

Ames exhibited three hybrid Cypripediums, viz: *Cypripedium* × *President McKinley* (*C. Harrisianum* × *C. insigne*), *C.* × *James A. Garfield* (*C. tonsum* var. *superbum* × *C. regale*) which received a First Class Certificate of Merit, and *C.* × *James K. Polk* (*C. Chamberlainianum* × *C. nitens*) which received Honorable Mention.

January 12. The exhibition on this day consisted of three very fine hybrid Cypripediums, as follows: — *Cypripedium* × *Chapmanii* (*C. Curtisii* × *C. bellatulum*) from Oakes Ames, *Cypripedium* × *Henry Graves, Jr.* (*C. Lawrenceanum* × *C. Marshallianum*) from J. E. Rothwell, and *Cypripedium* × *Hera*, var. *Trenton* (*C. Leeanum* var. *Masreelianum* × *C. Boxallii*) from C. G. Roebling of Trenton, N. J., the two former receiving Honorable Mention and the latter being awarded a First Class Certificate of Merit.

January 26. Henry T. Clinkaberry, of Trenton, N. J., exhibited a remarkably fine variety of *Cypripedium* × *Aylingii* var. *Washingtonianum* (*C. ciliolare*, giant variety, × *C. niveum* var. *grandiflorum*); this, without doubt, was *one* of the finest cypripediums exhibited for a number of years, combining as it did fine coloring and strength. It received the award of a Silver Gilt Medal.

February 2. The display of Freesias was disappointing, there having been a great falling off in late years of exhibits of this interesting class. R. & J. Farquhar & Co. exhibited a fine lot of Begonia Gloire de Lorraine var. *nana compacta*, for which they received a Silver Medal. Mrs. B. P. Cheney had twelve very fine plants of *Primula obconica*, and C. G. Roebling exhibited *Cypripedium* × *tessellatum* var. *Harrisianum*, for which he was awarded a First Class Certificate of Merit.

February 9. Walter P. Winsor exhibited *Dendrobium nobile* var. *Burfordiense*, for which he was awarded a Silver Medal. This is an unique form of *D. nobile* having the reverse marking of *D. Cooksoni*.

February 16. Mrs. F. L. Ames exhibited the most remarkable and interesting group of Dendrobiums ever shown within the remembrance of the Committee, receiving for the Collection a Silver Gilt Medal. They were as follows:

Dendrobium × *Ainsworthii* (type), and var. *roseum*,

" × *Amesianum*,

Dendrobium Amesianum var. × *grandiflorum*, which received a First Class Certificate of Merit,

" × *chrysodiscus*, which received a First Class Certificate of Merit,

" × *Cybele*, which received a Silver Medal,

" *Dulce*,

" × *euosmum*,

" *nobile* (type),

" " var. *Arnoldianum*,

" " " *Backhouseanum*, which received a Silver Medal,

" " " *Cooksoni*,

" " " *majus*,

" " " *nobilius*,

" " " *virginale*,

" *Robinsonianum*,

" × *Schneiderianum* var. *giganteum*, which received a First Class Certificate of Merit,

" × *splendidissimum* var. *grandiflorum*.

Walter Angus, gardener to Hon. Moses T. Stevens, North Andover, Mass., was awarded a First Class Certificate of Merit for Superior Cultivation of Begonia Gloire de Lorraine, and the Harvard Botanic Garden received awards as follows:

Primula stellata var. *alba*, First Class Certificate of Merit for Superior Cultivation,

Primula stellata var. *compacta*, Honorable Mention.

February 23. Mrs. John L. Gardner exhibited several plants of a seedling asparagus, which was claimed to be new, and which the Committee asked to have shown again after having been planted out. It received the award of Honorable Mention.

March 2. Oakes Ames exhibited *Coleus thyrsoideus*, a new flowering coleus of a pleasing color, receiving therefor a First Class Certificate of Merit.

March 9. James Comley exhibited a seedling Indian Azalea, var. New Century, for which he was awarded a gratuity.

SPRING EXHIBITION.

MARCH 19, 20, 21 AND 22.

This was a notable exhibition, and being the last large exhibition to be held in the old Hall each exhibitor apparently endeavored to do his utmost to make it a memorable one. It would not only be well nigh impossible but it would take too much space to give all the details of this exhibition, therefore mention will only be made of the more noticeable and important features. It is to be regretted that the class for Indian Azaleas is not competed for to a larger extent, the class (No. 29) for six named varieties not having an entry. Class No. 32, for Specimen Orchids brought out a grand display from Bayard Thayer (James Brydon, gardener). The display of Dutch Bulbs from the various exhibitors was all that could be desired, all being of exceptional merit. The exhibit of *Primula Sieboldi* by Frederic J. Rea showed great improvement, and was awarded a Bronze Medal, and the exhibits of Cyrus Lothrop of *Laelia flava*, Anson Phelps Stokes of *Asparagus Sprengeri* var. *compactus*, and M. H. Walsh of a Hardy Climbing Rose, were awarded First Class Certificates of Merit and were all remarkable for fine cultivation.

March 30. Col. Charles Pfaff exhibited *Dendrobium fimbriatum* var. *oculatum*, receiving a Bronze Medal for the same, and the Harvard Botanic Garden received Honorable Mention for *Asparagus schoberioides*.

April 6. E. S. Converse (D. Roy, gardener) displayed eighteen plants of dwarf Hydrangeas in pots for which he was awarded a gratuity.

After April 6th we had no exhibits until August 24th, when Oakes Ames (R. M. Grey, gardener) sent in a new hybrid orchid, *Cypripedium* × *Boxallo-Rothschildianum*, a plant of European origin, for which a Bronze Medal was awarded.

CHRYSANTHEMUM SHOW.

NOVEMBER 7, 8, 9 AND 10.

After August 24 nothing was shown until the Chrysanthemum Show which opened on November 7th and included plants for which prizes were offered at the delayed September shows.

First Chrysanthemum Show in the New Building.

This exhibition marked the opening of the new Hall by the Society and was a most gratifying success although made under the discouraging conditions prevailing in the new exhibition room.

The quality of the plants shown, as a whole, was never excelled here, and seldom equaled, although the interest in the extra large specimens seems to be falling off somewhat. It is correspondingly on the increase in the class for nine-inch pots and some very beautiful plants of this size were shown.

Mrs. B. P. Cheney, E. S. Converse, Walter Hunnewell, J. S. Bailey, Dr. C. G. Weld, and James Nicol were the principal exhibitors of Chrysanthemum plants in the various classes. The interesting classes for plants grown to one flower and stem were well competed for and included many fine specimens.

The first prize for twelve named plants went to Mrs. B. P. Cheney and the second to E. S. Converse.

Mrs. Cheney's plants were:

Kate Broomhead,
Louis Boehmer,
Miss Georgiana Pitcher,
Mrs. C. B. Freeman,
Mrs. F. A. Constable,
Mrs. J. G. Breer,
Mrs. J. Trainker,
Mutual Friend,
Peter Kay,
Shilowa,
Silver Cloud,
The Bard.

Mr. Converse's plants were:

Arethusa,
Edith Smith,
Golden Gate,
Jeannie Falconer,
Louis Boehmer,
Marion Henderson,
Mrs. C. B. Freeman,
Mrs. J. G. Breer,
Mrs. J. Lewis,
Red Warrior,
The Bard,
Theo.

For ten named plants in nine-inch pots, J. S. Bailey was first, Walter Hunnewell second, and E. S. Converse third.

Mr. Bailey's plants were:

Arethusa,
Casco,
Col. D. Appleton,
Golden Trophy,
Ivory,
John Shimpton,
Louis Boehmer,
Mrs. H. Robinson,
Mrs. J. Lewis,
Theo.

Mr. Hunnewell's plants were:

Arethusa,	Mrs. H. Weeks,
Black Hawk,	Mrs. J. Lewis,
Defender,	Mutual Friend,
Edna,	Oriental Glory,
Kate Broomhead,	The Bard.

Mr. Converse's plants were:

Black Hawk,	Mrs. H. Weeks,
Ivory,	Mrs. J. G. Breer,
Louis Boehmer,	Mutual Friend,
Marion Henderson,	Red Warrior,
Mrs. C. B. Freeman,	The Bard.

Among the displays not in competition a very important addition to the exhibition was the one made by R. & J. Farquhar & Co. of Standard Bays, Palms, Araucarias and Begonia Gloire de Lorraine var. Caledonia. This display filled the entire rear end of the hall and made a welcome background for the other exhibits. R. & J. Farquhar & Co. also showed for the first time the variegated form of *Ficus repens* for which a First Class Certificate of Merit was awarded.

Lager & Hurrell of Summit, N. J., made an extensive display of orchids which were the centre of much interest throughout the exhibition.

Two other exhibits were worthy of more than passing notice, the magnificent collection of Gymnogrammas, silver and golden, from Charles Evans, and the pan of *Nerine flexuosa excellens* from Mrs. Cornelius Vanderbilt of Newport, R. I. (Robert Laurie, gardener). The former were very finely grown specimens in perfect condition, and the latter was a remarkably well-flowered specimen of this old but rare bulb, a representative of a very interesting but much neglected class of plants.

Mrs. John L. Gardner showed *Asparagus deflexus*, an interesting form in the way of *A. Sprengeri*, and received a First Class Certificate of Merit for it.

November 30. J. Tailby & Son of Wellesley, put on exhibition specimens of their Begonia Glory of Wellesley. This begonia is claimed to be a sport from the Gloire de Lorraine and was shown to us late last winter but not in condition to secure

recognition. It was again shown on the above date, at our request, in much better condition, proving the plant to be a much stronger growing form than the original and with larger flowers. It received the award of a Silver Medal.

Amount appropriated for prizes and gratuities for 1901		$2000 00
Amount awarded for prizes and gratuities	$1199 00	
Estimated cost of medals awarded	61 00	1260 00
Leaving an unexpended balance of		$740 00

PRIZES AND GRATUITIES AWARDED FOR PLANTS. 1901.

JANUARY 5.

PRIMULA SINENSIS.—Six plants in not less than six-inch pots:

First, Mrs. John L. Gardner	$4 00
Second, Mrs. John L. Gardner	3 00
Third, Mrs. B. P. Cheney	2 00

PRIMULA STELLATA.—Six plants in not less than six-inch pots:

Second, Mrs. John L. Gardner	2 00

PRIMULA OBCONICA HYBRIDS.—Six plants in not less than six-inch pots:

First, Mrs. B. P. Cheney	4 00
Second, Mrs. B. P. Cheney	3 00
Third, Mrs. John L. Gardner	2 00

FEBRUARY 2.

FREESIAS. — Six pots or pans:

Second, H. Dumaresq	4 00

Gratuity:—

Mrs. B. P. Cheney, Twelve plants *Primula obconica*	5 00

FEBRUARY 16.

Gratuity:—

Harvard Botanic Garden, Display of Lachenalias and *Primula obconica*	8 00

FEBRUARY 23.

Gratuity:—

Harvard Botanic Garden, Thirty plants of seedling Cyclamen	8 00

MARCH 9.

Gratuities:—

James Comley, Seedling Indian Azalea New Century . . . 3 00
Bussey Institution, Display of Indian Azaleas, *Pyrus floribunda* var., and *Staphylea colchica* 4 00

SPRING EXHIBITION.

MARCH 19, 20, 21, AND 22.

Theodore Lyman Fund.

INDIAN AZALEAS.—Specimen plant, named:
First, Edward Butler $8 00
Second, Dr. C. G. Weld 6 00
Third, Dr. C. G. Weld 4 00

Society's Prizes.

ERICAS.—Six, not less than three species:
First, Dr. C. G. Weld 6 00
ORCHID.—Single plant:
First, Bayard Thayer 12 00
Second, Bayard Thayer 10 00
Third, Bayard Thayer 6 00
Fourth, Mrs. John L. Gardner 4 00
STOVE OR GREENHOUSE PLANT.—Specimen in bloom, other than Azalea or Orchid, named:
First, Dr. C. G. Weld 8 00
Second, James Comley 6 00
HARDWOODED GREENHOUSE PLANTS.—Four, in bloom:
First, Dr. C. G. Weld 10 00
Second, Dr. C. G. Weld 8 00
HARDY FLOWERING DECIDUOUS SHRUBS, FORCED.—Four, of four distinct species, named:
First, Mrs. John L. Gardner 8 00
Second, Bussey Institution 5 00
HARDY PRIMROSES.—Twelve plants of distinct varieties:
Third, Mrs. John L. Gardner 2 00
HARDY POLYANTHUSES.—Twelve plants of distinct varieties:
Second, Dr. C. G. Weld 4 00
CYCLAMENS.—Ten plants:
First, Mrs. B. P. Cheney 15 00
Second, J. S. Bailey 12 00
Ten plants, in not over seven-inch pots:
First, Mrs. B. P. Cheney. 8 00

Second, Mrs. B. P. Cheney	$6 00
Third, J. S. Bailey	4 00
Single plant:	
First, Mrs. B. P. Cheney	5 00
Second, H. H. Rogers	4 00
Third, H. H. Rogers	3 00
CINERARIAS.—Six varieties:	
First, Mrs. B. P. Cheney	10 00
Second, Mrs. John L. Gardner	8 00
Third, Dr. C. G. Weld	6 00
Three varieties:	
First, Mrs. John L. Gardner	6 00
Second, Mrs. B. P. Cheney	5 00
Third, Mrs. John L. Gardner	4 00
Single plant:	
First, Mrs. John L. Gardner	3 00
Second, H. H. Rogers	2 00
HYACINTHS.—Twelve named varieties in pots, one in each pot:	
First, Dr. C. G. Weld	8 00
Second, Mrs. John L. Gardner	5 00
Third, Bussey Institution	3 00
Six named varieties in pots, one in each pot:	
First, Dr. C. G. Weld	5 00
Second, Mrs. John L. Gardner	4 00
Third, Mrs. John L. Gardner	3 00
Single named bulb in pot:	
First, Bussey Institution	2 00
Second, Mrs. John L. Gardner	1 00
Three pans, not to exceed twelve inches, ten bulbs of one variety in each pan:	
First, Dr. C. G. Weld	6 00
Second, Dr. C. G. Weld	4 00
Third, Mrs. John L. Gardner	3 00
Two pans, not to exceed twelve inches, ten bulbs of one variety in each pan:	
First, Dr. C. G. Weld	4 00
Second, Mrs. John L. Gardner	3 00
Third, Bussey Institution	2 00
Single pan, not to exceed twelve inches, with ten bulbs of one variety:	
First, Mrs. John L. Gardner	3 00
Second, Bussey Institution	2 00
Third, Bussey Institution	1 00
TULIPS.—Six eight-inch pans, nine bulbs of one variety in each:	
First, Dr. C. G. Weld	6 00
Second, W. S. Ewell & Son	4 00
Third, W. S. Ewell & Son	2 00

Three eight-inch pans, nine bulbs of one variety in each:

First, Dr. C. G. Weld	3 00
Second, W. S. Ewell & Son	2 00
Third, W. S. Ewell & Son	1 00

Three ten-inch pans, twelve bulbs of one variety in each:

First, Dr. C. G. Weld	5 00
Second, Dr. C. G. Weld	4 00
Third, W. S. Ewell & Son	3 00
Fourth, W. S. Ewell & Son	2 00

POLYANTHUS NARCISSUS.—Four seven-inch pots, four bulbs in each, distinct varieties:

First, Dr. C. G. Weld	4 00
Second, Dr. C. G. Weld	3 00
Third, Bussey Institution	2 00

JONQUILS.—Six pots or pans, not exceeding eight inches, the number of bulbs in each to be at the discretion of the grower:

First, W. S. Ewell & Son	4 00
Second, Dr. C. G. Weld	3 00
Third, W. S. Ewell & Son	2 00

NARCISSUSES.—Six eight-inch pans, distinct varieties, single or double:

First, Dr. C. G. Weld	6 00
Second, W. S. Ewell & Son	4 00
Third, Harry S. Rand	3 00

Three eight-inch pans:

First, W. S. Ewell & Son	3 00
Second, Dr. C. G. Weld	2 00

LILIUM LONGIFLORUM.—Four pots, not exceeding ten inches:

First, E. N. Peirce & Son	10 00
Second, E. N. Peirce & Son	8 00

LILY OF THE VALLEY.—Six pots or pans, not exceeding eight inches:

First, W. S. Ewell & Son	4 00
Second, Bussey Institution	3 00
Third, Bussey Institution	2 00

CROCUSES.— Three boxes, each eight by twenty inches, three distinct varieties:

First, W. S. Ewell & Son	3 00
Second, W. S. Ewell & Son	2 00
Third, Bussey Institution	1 00

IXIAS.—Six pots or pans, in varieties:

First, Dr. C. G. Weld	5 00

TRITONIAS.—Six pots or pans, in varieties:

First, Dr. C. G. Weld	5 00

ROMAN HYACINTHS.—Six eight-inch pans, ten bulbs in a pan:

First, W. S. Ewell & Son	4 00

Second, W. S. Ewell & Son 2 00
Third, Bussey Institution 1 00

GENERAL DISPLAY OF SPRING BULBS.—All classes:
First, Dr. C. G. Weld 25 00
Second, W. S. Ewell & Son 20 00
Third, Bussey Institution 15 00

Gratuities:—

H. H. Rogers, Collection of Azaleas and Cyclamen . . . 5 00
Mrs. B. P. Cheney, Collection of Cyclamen 6 00
Mrs. John L. Gardner, Collection of Hyacinths 3 00
Hon. M. T. Stevens, Collection of Begonia Gloire de Lorraine . 5 00
James Comley, Display of Tricolor Geraniums . . . 2 00
I. G. Noyes, Collection of Cacti 2 00
Bussey Institution, Collection of Native Plants 5 00
Harvard Botanic Garden, Display 20 00

APRIL 6.

Gratuity:—

E. S. Converse, Display of eighteen plants of Dwarf Hydrangeas 8 00

CHRYSANTHEMUM SHOW.

NOVEMBER 7, 8, 9, AND 10.

☞ This was the opening exhibition held by the Society in its new halls and includes the postponed **Annual Exhibition of Plants and Flowers** and **Annual Exhibition of Fruits and Vegetables,** which were scheduled for September.

PALMS.—Pair, in pots or tubs, not more than twenty-four inches in diameter:
First, Mrs. John L. Gardner 12 00
Pair, in pots not more than fourteen inches in diameter:
First, Dr. C. G. Weld 8 00
Second, Mrs. John L. Gardner 6 00

GREENHOUSE PLANTS.—Collection containing foliage plants of all descriptions, not to exceed forty plants, in pots or tubs:
First, Mrs. John L. Gardner 45 00
Six Greenhouse and Stove Plants, of different named varieties, two Crotons admissible:
First, Mrs. John L. Gardner 25 00
Second, J. S. Bailey 20 00

TABLE DECORATION.—For fifteen covers, in one receptacle, only one entry admissible:
First, Edward J. Mitton 10 00

FLOWERING GREENHOUSE PLANT.—Single specimen, named:
First, Dr. C. G. Weld 8 00
FERNS.—Specimen, other than Tree Fern:
First, James L. Little 4 00
Second, Charles Evans 3 00
DRACÆNAS.—Six named varieties:
First, J. S. Bailey 8 00
Second, Mrs. John L. Gardner 5 00
CROTONS.—Six named varieties, in not less than eight-inch pots:
First, J. S. Bailey 10 00
CYCAD.—Single plant, named:
First, Dr. C. G. Weld 10 00
CHRYSANTHEMUMS.—Display of twelve named plants, any or all classes, distinct varieties:
First, Mrs. B. P. Cheney 60 00
Second, E. S. Converse 50 00
Display of ten named plants, any or all classes, distinct varieties, in not exceeding nine-inch pots:
First, J. S. Bailey 30 00
Second, Walter Hunnewell 25 00
Third, E. S. Converse 20 00
Three Japanese Incurved:
First, Mrs. B. P. Cheney 12 00
Specimen Japanese Incurved, named variety:
First, Mrs. B. P. Cheney 6 00
Second, E. S. Converse 5 00
Specimen Reflexed, named variety.
First, E. S. Converse 6 00
Second, Mrs. B. P. Cheney 5 00
Third, E. S. Converse 4 00
Specimen Anemone Flowered, named variety:
First, Walter Hunnewell 6 00
Second, J. S. Bailey 5 00
Specimen Pompon, named variety:
First, E. S. Converse 4 00
Second, Mrs. B. P. Cheney 3 00
Twelve plants, of twelve different varieties, grown to one stem and bloom, in not over six-inch pots, preference being given to plants not more than three feet in height:
First, James Nicol 8 00
Second, Dr. C. G. Weld 6 00
Third, E. S. Converse 4 00
Fourth, R. C. Winthrop 2 00
Six plants grown as above but all of one color, Red:
First, James Nicol 4 00
Second, Dr. C. G. Weld 3 00
Third, E. S. Converse 2 00

White:
- First, James Nicol 4 00
- Second, James Nicol 3 00
- Third, Dr. C. G. Weld 2 00

Pink:
- First, Dr. C. G. Weld 4 00
- Second, Dr. C. G. Weld 3 00

Yellow:
- First, James Nicol 4 00
- Second, Dr. C. G. Weld 3 00
- Third, Dr. C. G. Weld 2 00

Any other color:
- First, Dr. C. G. Weld 4 00
- Second, Dr. C. G. Weld 3 00
- Third, R. C. Winthrop 2 00

Six plants grown to bush form, in not over eight-inch pots, without stakes:
- Second, J. S. Bailey 6 00

Group of Chrysanthemums, arranged for effect, with palms and decorative foliage plants, limited to one hundred square feet:
- First, Mrs. John L. Gardner 25 00

Gratuities:—

E. S. Converse, Eight plants Standard Chrysanthemums . . 16 00
Dr. C. G. Weld, Display of single stem Chrysanthemums . . 10 00
James Nicol, Single stem Chrysanthemums 3 00
Walter Hunnewell, three Chrysanthemum plants 5 00
Lager & Hurrell, Summit, N. J., Display of Orchids . . . 25 00
H. N. Eaton, Display of *Lilium Harrisii* 6 00
E. S. Converse, *Peristeria elata* 2 00
Dr. C. G. Weld, Display of Heaths 2 00
R. & J. Farquhar & Co., Display of Bay-trees, Palms, Araucarias and Begonia Caledonia 50 00
Charles Evans, Display of Gymnogrammas, silver and golden . 15 00
F. Skinner, Stag-horn Ferns 2 00
James Anderson, Crested Nephrolepis 1 00

SOCIETY'S SILVER GILT MEDALS.

January 26. Henry T. Clinkaberry, Trenton, N. J., for *Cypripedium* × *Aylingii* var. *Washingtonianum* (*C. ciliolare*, giant var. × *C. niveum grandiflorum*).

February 16. Mrs. F. L. Ames, for collection of Dendrobiums:
D. Ainsworthii (type), *D. nobile* var. *Arnoldianum*,
" " var. *roseum*, " " " *Backhouseanum*,
" *Amesianum*, " " " *Cooksoni*.

D. Amesianum, var. *grandiflorum*,
" *chrysodiscus*,
" *Cybele*,
" *Dulce*,
" *euosmum*,
" *nobile*,
D. nobile var. *majus*,
" " " *nobilius*,
" " " *virginale*,
" *Robinsonianum*,
" *Schneiderianum giganteum*,
" *splendidissimum grandiflorum*.

SOCIETY'S SILVER MEDALS.

February 2. R. & J. Farquhar & Co., for Begonia Gloire de Lorraine var. *nana compacta*.

February 9. Walter P. Winsor, for *Dendrobium nobile* var. *Burfordiense*.

" 16. Mrs. F. L. Ames, for *Dendrobium nobile Backhouseanum*.

" " Mrs. F. L. Ames, for *Dendrobium Cybele*.

November 30. J. Tailby & Son, for Begonia Glory of Wellesley.

December 21. Henry T. Clinkaberry, for *Laelio-Cattleya Cappei* var. *Intensity* (*C. Warscewiczii* var. *Lagerii* × *L. cinnabarina*), the second prize for American Seedling Orchid, other than Cypripedium, exhibited by the originator.

SOCIETY'S BRONZE MEDALS.

Spring Exhibition, March 19–22. Frederic J. Rea, for collection of *Primula Sieboldi*, sixteen varieties.

March 30. Col. Charles Pfaff, for *Dendrobium fimbriatum* var. *oculatum*.

August 24. Oakes Ames, for new Hybrid Orchid, *Cypripedium* × *Boxallo-Rothschildianum*.

FIRST CLASS CERTIFICATES OF MERIT.

January 5. Oakes Ames, for *Cypripedium* × *James A. Garfield* (*C. tonsum* var. *superbum* × *C. regale*).

January 12. C. G. Roebling, Trenton, N. J., for new seedling *Cypripedium* × *Hera* var. *Trenton* (*C. Leeanum* var. *Masreelianum* × *C. Boxalli*).

February 2. C. G. Roebling, for *Cypripedium* × *tessellatum* var. *Harrisianum*.

February 16. Mrs. F. L. Ames, for *Dendrobium chrysodiscus*.

" " Mrs. F. L. Ames, for *Dendrobium Schneiderianum giganteum*.

" " Mrs. F. L. Ames, for *Dendrobium Amesianum* var. *grandiflorum*.

" " Walter Angus, for Superior Cultivation of Begonia Gloire de Lorraine.

" " Harvard Botanic Garden (Robert Cameron, gardener), for Superior Cultivation of *Primula stellata* var. *alba*.

March 2. Oakes Ames, for *Coleus thyrsoideus*.

Spring Exhibition, March 19–22. Cyrus Lothrop (H. Cole, gardener), for Superior Cultivation of *Lælia flava*.

" " " " Anson Phelps Stokes, for *Asparagus Sprengeri* var. *compactus*.

" " " " M. H. Walsh, for Hardy Hybrid Climbing Rose Sweetheart.

Chrysanthemum Show, November 7–10. Mrs. John L. Gardner, for *Asparagus deflexus*.

" " " " Mrs. Cornelius Vanderbilt, for *Nerine flexuosa excellens*.

" " " " R. & J. Farquhar & Co., for *Ficus repens variegata*.

HONORABLE MENTION.

January 5. J. E. Rothwell, for *Cypripedium Longwoodense* (*C. Leeanum* var. *Masreelianum* × *C. Charlesworthii*).

" " Oakes Ames, for *Cypripedium James K. Polk* (*C. Chamberlainianum* × *C. niveum*).

" 12. Oakes Ames, for *Cypripedium* × *Chapmanii* (*C. Curtisii* × *C. bellatulum*).

" " J. E. Rothwell, for *Cypripedium* × *H. Graves, Jr.* (*C. Lawrenceanum* × *C. Marshallianum*).

February 16. Harvard Botanic Garden, for *Primula stellata* var. *compacta*.

" 23. Mrs. John L. Gardner, for Seedling Asparagus.

Spring Exhibition, March 19–22. Mrs. Warren H. Heustis, for Superior Cultivation of *Oxalis rosea*.

March 30. Harvard Botanic Garden, for *Asparagus schoberioides*.

Chrysanthemum Show, November 7–10. George McWilliam, for Helicofilia Sport.

December 21. J. E. Rothwell, for Seedling Orchid, *Cattleya intermedia* × *Lælia cinnabarina*.

ARTHUR H. FEWKES,
JAMES WHEELER,
WM. J. MARTIN,
ROBERT CAMERON,
ROBERT MELROSE GREY,
} *Committee on Plants.*

REPORT

OF THE

COMMITTEE ON FLOWERS

FOR THE YEAR 1901.

By J. WOODWARD MANNING, CHAIRMAN.

The Report of the Flower Committee for the year 1901 must of necessity be short, owing to the lack of exhibits throughout the year.

Such exhibits as could be held were very creditable and attracted the usual amount of attention. Unfortunately, the Rose, Pæony and Dahlia Shows, which have interested the public so largely in the last few years, could not be held, but we have every reason to believe that there would have been very creditable exhibits in this line had there been opportunity to enter such.

The Spring Exhibition was rich in its display of forced Roses and Carnations.

The Chrysanthemum Show showed an advance in the careful culture of these beautiful flowers and proved that the limit of perfection was elastic and that what seemed impossible of improvement yet continued to show further excellence. A large number of new exhibitors made displays at this exhibition and the competition was even closer than it has been in past years. There seems to be no indication of lack of popularity in this flower this year.

With the added facilities that our new hall affords it would seem that we should be able to give the exhibitors the full allowance of room that is necessary that they may be able to display their exhibits to the best advantage, and also to enable the public to gain free access for the enjoyment of such exhibits.

We are hoping that the following year we shall be able to report the great improvement in display, as well as added interest on the part of the public, that would seem called for in view of the greatly increased facilities we now have for future exhibits.

Your Committee has awarded prizes to the money value of $979.00 during the year, leaving a balance of $1521.00 from which should be deducted the necessary amount to pay for the four Silver Medals, the three Silver Gilt Medals, two Bronze Medals and seven First Class Certificates of Merit.

PRIZES AND GRATUITIES AWARDED FOR FLOWERS.

1901.

JANUARY 5.

PRIMULA SINENSIS.— Display of fifty or more individual blooms:	
First, Mrs. John L. Gardner	$2 00
Second, Mrs. John L. Gardner	1 00
FREESIAS.— Vase of fifty spikes:	
First, Mrs. E. M. Gill	2 00
Gratuities:—	
J. E. Rothwell, Display of Cypripediums	2 00
Mrs. E. M. Gill, Display	1 00

FEBRUARY 2.

VIOLETS.— Best collection of varieties, in bunches of fifty blooms each:	
First, Norris F. Comley	4 00
Second, Norris F. Comley	3 00
CARNATIONS.— Display of cut blooms, with foliage, not less than six varieties:	
First, M. A. Patten	8 00
Third, Miss Hattie B. Winter	4 00
CAMELLIAS.— Display of named varieties, cut flowers with foliage, not less than twelve blooms, in not less than six varieties:	
First, James Comley	4 00
Second, James Comley	3 00
Gratuities:—	
James Comley, Camellias	4 00
J. W. Howard, Camellias	3 00
W. J. Clemson, Two vases Freesias	2 00
Mrs. E. M. Gill, Display	2 00

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CARNATIONS.— Display of cut blooms, with foliage, not less than six varieties:	
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CAMELLIAS.— Display of named varieties, cut flowers with foliage, not less than twelve blooms, in not less than six varieties:	
First, James Comley	4 00
Second, James Comley	3 00
Gratuities:—	
James Comley, Camellias	4 00
J. W. Howard, Camellias	3 00
W. J. Clemson, Two vases Freesias	2 00
Mrs. E. M. Gill, Display	2 00

FEBRUARY 9.

Gratuities:—

James Comley, Camellias	5 00
Mrs. E. M. Gill, Display	1 00

FEBRUARY 16.

Gratuity:—

James Comley, Display	6 00

FEBRUARY 23.

Gratuities:—

James E. Rothwell, Display of Orchids	1 00
Norris F. Comley, Violets	1 00
James Comley, Camellias	5 00
Mrs. E. M. Gill, Display	1 00

MARCH 2.

Gratuities:—

John L. Bird, *Acacia pubescens*	1 00
Mrs. E. M. Gill, Display	1 00

MARCH 9.

Gratuities:—

James Comley, Basket of Camellias	3 00
Mrs. E. M. Gill, Display	1 00

SPRING EXHIBITION.

MARCH 19, 20, 21 AND 22.

HYBRID PERPETUAL ROSES.— Twelve blooms, in not less than four named varieties:	
First, Mrs. A. W. Spencer	12 00
Six blooms, not less than three named varieties:	
First, Col. Charles Pfaff	6 00
Second, Mrs. A. W. Spencer	5 00
Twelve blooms of Ulrich Brunner:	
First, E. M. Wood & Co.	10 00
Second, John McFarland	8 00
TENDER ROSES, IN VASES.— Twelve blooms of American Beauty:	
First, E. M. Wood & Co.	15 00
Second, Exeter Rose Conservatories, Exeter, N. H.	12 00
Third, Briar Cliff Greenhouses, Scarboro, N. Y.	10 00

Twenty-five blooms of The Bride:	
First, E. M. Wood & Co.	10 00
Second, John Pritchard	8 00
Third, W. H. Elliott	6 00
Twenty-five blooms of Bridesmaid:	
First, E. M. Wood & Co.	10 00
Second, John Pritchard	8 00
Third, W. H. Elliott	6 00
Twenty-five blooms of Meteor:	
First, W. H. Elliott	10 00
Twenty-five blooms of Souvenir de Président Carnot:	
First, W. H. Elliott	10 00
Twenty-five blooms of Liberty:	
First, E. M. Wood & Co.	12 00
Second, W. H. Elliott	8 00
CARNATIONS.— Vase of one hundred cut blooms, with foliage, not less than six varieties:	
First, M. A. Patten	8 00
Second, Peter Fisher	6 00
Third, Col. Charles Pfaff	4 00
Twenty-five blooms of any named Crimson variety:	
Second, Briar Cliff Greenhouses, for Gen. Maceo	2 00
Twenty-five blooms of any named Dark Pink variety, (William Scott or darker):	
First, Peter Fisher, for Mrs. Thomas W. Lawson	3 00
Second, Briar Cliff Greenhouses, for Mrs. Thomas W. Lawson	2 00
Twenty-five blooms of any named Light Pink variety, (Lighter than William Scott):	
Second, Briar Cliff Greenhouses, for Maud Dean	2 00
Twenty-five blooms of any named Scarlet variety:	
First, Briar Cliff Greenhouses, for G. H. Crane	3 00
Twenty-five blooms of any named White variety:	
First, Briar Cliff Greenhouses, for White Cloud	3 00
Twenty-five blooms of any named Yellow Variegated variety:	
First, Briar Cliff Greenhouses, for Gold Nugget	3 00
Second, S. J. Goddard, for Eldorado	2 00
Twenty-five blooms of any named White Variegated variety:	
First, Briar Cliff Greenhouses, for G. M. Bradt	3 00
VIOLETS.—Bunch of one hundred blooms of Lady Hume Campbell:	
First, D. T. Harrigan	3 00
Second, Norris F. Comley	2 00
Bunch of one hundred blooms of Marie Louise:	
First, Harry S. Rand	3 00
Second, Norris F. Comley	2 00
Bunch of one hundred blooms of any other double variety:	
First, Norris F. Comley	3 00

Bunch of one hundred blooms of any single variety:

First, William Sim	3 00
Second, William Sim	2 00

Gratuities:—

Col. Charles Pfaff, Magna Charta Roses	8 00
The Floral Exchange, Inc., Philadelphia, Pa., Vase of Rose Queen of Edgely	5 00
Miss M. S. Walker, Vase of Roses	8 00
Col. Charles Pfaff, Display of Roses	3 00
Charles Evans, Mignonette	2 00
C. H. Souther, Vase of Antirrhinums	1 00
Norris F. Comley, Lilacs	2 00
Mrs. E. M. Gill, Basket of Flowers	3 00
James Comley, Display	6 00
Mrs. A. W. Spencer, Display	6 00
Mrs. E. M. Gill, "	2 00

MARCH 30.

Gratuity:—

O. B. Hall, Seedling Petunias	1 00

CHRYSANTHEMUM SHOW.

NOVEMBER 5, 6, 7 AND 8.

☞ This was the opening exhibition held by the Society in its new halls and includes the postponed **Annual Exhibition of Plants and Flowers** and **Annual Exhibition of Fruits and Vegetables,** which were scheduled for September.

Special Prizes.

Josiah Bradlee Fund.

CHRYSANTHEMUMS.— Twenty-five blooms, of twenty-five distinct varieties, named, a piece of plate or value in money:

First, Mrs. B. P. Cheney	$18 00
Second, Miss E. J. Clark	12 00
Third, Col. Charles Pfaff	8 00
Fourth, Robert Laurie	6 00

Six vases, of six named varieties, ten blooms each:

First, Mrs. A. W. Spencer	30 00
Second, Mrs. B. P. Cheney	25 00
Third, Miss E. J. Clark	20 00
Fourth, Waban Rose Conservatories	15 00

Henry A. Gane Memorial Fund.

Best twelve specimen blooms of any of the Seedling Chrysanthemums originated by the late Henry A. Gane:

First, Waban Rose Conservatories	20 00
Second, Mrs. A. W. Spencer	10 00

Society's Prizes.

Twelve blooms, Incurved, named, in vases:	
First, E. S. Converse	8 00
Twelve blooms, Japanese, named, in vases:	
First, Mrs. B. P. Cheney	10 00
Twelve blooms, Japanese Incurved, named, in vases:	
First, Mrs. B. P. Cheney	10 00
Second, Peter B. Robb	6 00
Third, Col. Charles Pfaff	4 00
Twelve blooms, Anemone, named, in vases:	
First, E. S. Converse	8 00
Second, Dr. C. G. Weld	6 00
Third, C. H. Souther	4 00
Six blooms, Incurved, named, in vases:	
First, Dr. C. G. Weld	5 00
Second, E. S. Converse	4 00
Third, C. H. Souther	2 00
Six blooms, Japanese, named, in vases:	
First, Mrs. B. P. Cheney	6 00
Second, Peter B. Robb	4 00
Third, E. S. Converse	2 00
Six blooms, Japanese Incurved, named, in vases:	
First, Mrs. B. P. Cheney	6 00
Second, Col. Charles Pfaff	4 00
Third, E. S. Converse	2 00
Six blooms, Reflexed, named, in vases:	
First, Mrs. B. P. Cheney	6 00
Second, Peter B. Robb	4 00
Third, E. S. Converse	2 00
Six blooms, Anemone, named, in vases:	
First, E. S. Converse	5 00
Second, E. S. Converse	4 00
Vase of ten blooms on long stems, Pink, named:	
First, Mrs. A. W. Spencer, for Viviand Morel	10 00
Second, Robert Laurie	8 00
Third, C. D. Sias	6 00
Vase of ten blooms on long stems, Red, named:	
First, Mrs. A. W. Spencer	10 00
Second, Miss E. J. Clark	8 00
Third, Col. Charles Pfaff	6 00

Vase of ten blooms on long stems, White, named:	
First, Mrs. A. W. Spencer	10 00
Second, Peter B. Robb	8 00
Third, Robert Laurie	6 00
Vase of ten blooms on long stems, Yellow, named:	
First, Mrs. A. W. Spencer	10 00
Second, Robert Laurie	8 00
Third, Col Charles Pfaff	6 00
Vase of ten blooms on long stems, any other color:	
First, Mrs. A. W. Spencer	10 00
Second, Robert Laurie	8 00
Third, Miss E. J. Clark	6 00
Vase of blooms on long stems, arranged in the Society's large China vases; prizes to be repeated every day during the exhibition:	
First, Col. Charles Pfaff	10 00
Second, Mrs. A. W. Spencer	9 00
Third, E. N. Peirce & Sons	8 00
Fourth, Norris F. Comley	7 00
DAHLIAS.— Cactus, twelve blooms, named varieties:	
First, W. H. Symonds	4 00
Decorative, twelve blooms, named varieties:	
First, W. H. Symonds	4 00
Show, six blooms, named varieties:	
First, W. H. Symonds	2 00
Second, W. H. Symonds	1 00
Fancy, six blooms, named varieties:	
First, W. H. Symonds	2 00
General Display, one hundred or more bottles, in the Society's racks, arranged for effect:	
First, W. H. Symonds	12 00

Gratuities:—

E. S. Converse, Display of Plumed Chrysanthemums	2 00
Mrs. E. M. Gill, Display of Pompon Chrysanthemums	1 00
Mrs. E. M. Gill, Display of Chrysanthemums	5 00
Mrs. A. W. Spencer, Three Vases of Chrysanthemums	3 00
Mrs. A. W. Spencer, Two Vases of Chrysanthemums	6 00
Carl Jurgens, Vase of twenty-five American Beauty Roses	10 00
John N. May, Rose of Mrs. Oliver Ames	2 00
M. A. Patten, Display of Carnations	8 00
James Comley, Display	8 00
John Thomas, Display	4 00
Blue Hill Nursery, Display	2 00

AWARDS OF NOVEMBER 8.

CHRYSANTHEMUMS.—Vase of blooms on long stems, arranged in the Society's large China vases:

First, Mrs. A. W. Spencer	10 00
Second, Col. Charles Pfaff	9 00
Third, E. N. Peirce & Sons	8 00
Fourth, Norris F. Comley	7 00

Gratuities:—

Col. Charles Pfaff, Display of Orchids	3 00
Mrs. B. P. Cheney, Display	8 00

AWARDS OF NOVEMBER 9.

CHRYSANTHEMUMS.—Vase of blooms on long stems, arranged in the Society's large China vases:

First, Col. Charles Pfaff	10 00
Second, Mrs. A. W. Spencer	9 00
Third, E. N. Peirce & Sons	8 00
Fourth, Norris F. Comley	7 00

VIOLETS.—Single, collection of varieties, fifty blooms each:

First, Norris F. Comley	5 00

Double, collection of varieties, fifty blooms each:

First, Norris F. Comley	5 00

AWARDS OF NOVEMBER 10.

CHRYSANTHEMUMS.—Vase of blooms on long stems, arranged in the Society's large China vases:

First, Col. Charles Pfaff	10 00
Second, Mrs. A. W. Spencer	9 00
Third, E. N. Peirce & Sons	8 00
Fourth, Norris F. Comley	7 00

VASE OF FLOWERS.—For table decoration, on the last day of the exhibition:

First, Mrs. E. M. Gill	4 00
Second, Miss Hattie B. Winter	3 00

SILVER GILT MEDALS.

February 2. Oakes Ames, first prize for Display of Orchids, named species and varieties, filling not less than twenty bottles.

Spring Exhibition, March 19–22. Mrs. F. L. Ames, first prize for Display of Orchids, named species and varieties, filling not less than twenty bottles.

Chrysanthemum Show, November 7–10. James E. Rothwell, first prize for Display of Orchids, named species and varieties, filling not less than twenty bottles.

SOCIETY'S SILVER MEDALS.

Spring Exhibition, March 19–22. James E. Rothwell, second prize for Display of Orchids, named species and varieties, filling not less than twenty bottles.

" " " " Anson Phelps Stokes, for Climbing Rose, Gold or Ophir.

Chrysanthemum Show, November 7–10. James Comley, for Pompon Chrysanthemums.

" " " " Col. Charles Pfaff, for largest number of first prizes for Vase of Chrysanthemums.

BRONZE MEDALS.

October 5. George McWilliam, for *Lælio-Cattleya* × *Catherine L. Whitin* var. *inversum*, and *Cattleya Harrisonii* × *Lælia purpurata*, Seedling.

Chrysanthemum Show, November 7–10. Mrs. A. W. Spencer, for largest number of second prizes for Vase of Chrysanthemums.

FIRST CLASS CERTIFICATES OF MERIT.

January 12. Harvard Botanic Garden, for *Euphorbia pulcherrima plenissima*.

" 26. H. T. Clinkaberry, Trenton, N. J., for *Cypripedium Thayerianum Trenton* var. (*C. Lawrenceanum* Pitcher's var. × *Boxallii atratum*).

" " H. T. Clinkaberry, for *Cypripedium Garret A. Hobart*, (*C. Chantinii* × *C. Lathamianum*).

" " H. T. Clinkaberry, for *Cypripedium Leeanum Mrs. Clinkaberry*, *Leeanum* var.

Chrysanthemum Show, Nov. 7–10. Peter Fisher, for Carnation Governor Wolcott.

" " " " Peter Fisher, for Carnation Nelson Fisher.

" " " " Albert Roper, for Carnation Fair Maid

HONORABLE MENTION.

January 5. J. E. Rothwell, for *Cypripedium Niobe* (*C. Spicerianum* × *C. Fairieanum*).

February 16. Harvard Botanic Garden, for *Bougainvillea speciosa* var. *splendens*.

Chrysanthemum Show, November 7–10. Peter Fisher, for Carnation Evangeline.

" " " " Peter Fisher, for Carnation Mrs. M. A. Patten

Chrysanthemum Show, November 7-10.				Peter Fisher, for Carnation Enchantress.
"	"	"	"	D. Carmichael, for Carnation Symphony.

J. WOODWARD MANNING,
MICHAEL H. NORTON,
KENNETH FINLAYSON,
FREDERICK S. DAVIS,
JAMES COMLEY,
} *Committee on Flowers.*

REPORT

OF THE

COMMITTEE ON FRUITS

FOR THE YEAR 1901.

By E. W. WOOD, CHAIRMAN.

The fruits in general cultivation in New England passed the winter of 1900–1901 with comparatively little injury. The peach buds in some localities were injured more or less, but generally there were enough live buds left to produce a fair crop and the southern fruit was supplemented by an unusual amount of native fruit.

The apple crop was almost an entire failure; there was more than the usual amount of bloom for the off year but the continued cold wet weather prevented fertilization of the blossoms and the set of fruit was exceedingly light. The conditions have been favorable for a vigorous growth of the trees the past season, and barring unfavorable conditions at the time of blooming, an abundant crop may be expected the coming year.

It is conceded by intelligent fruit growers that there is no place where the pear can be grown more successfully than in the vicinity of Boston. The exhibitions of this fruit have continued to improve in quality since the change in the schedule. Instead of giving prizes for collections of twenty, fifteen and ten varieties the premiums are awarded for single dishes being more in number and larger in amount for the more desirable varieties. Among growers for market the varieties are closely confined to six or eight, several others being added for the home garden to furnish a continuous supply during the season.

Owing to the obligation to vacate the Society's building on Tremont Street and the delay in completing the present building, the Strawberry exhibition and the Summer exhibits of the small fruits were omitted the past season. The scheduled exhibition for November 7th was the first fruit exhibit in the new building and the Society has never had a finer show of late fall and winter fruits. Apples were limited in quantity but were good in quality. There was a large display of pears and many exceptionally fine specimens.

The appropriation for the Fruit Committee was seventeen hundred dollars; there have been awarded in premiums and gratuities six hundred and fifty-six dollars, leaving an unexpended balance of ten hundred and forty-four dollars.

PRIZES AND GRATUITIES AWARDED FOR FRUITS.

1901.

SPRING EXHIBITION.

MARCH 19, 20, 21 AND 22.

WINTER APPLES.— Baldwin:	
First, E. M. Bruce	$3 00
Second, C. F. Boyden	2 00
Third, W. H. Boyden	1 00
Northern Spy:	
First, Hiram Heyworth	3 00
Second, C. F. Boyden	2 00
Third, E. M. Bruce	1 00
Roxbury Russet:	
First, W. H. Boyden	3 00
Second, H. R. Kinney	2 00
Third, A. E. Hartshorn	1 00
Tompkins King:	
First, C. F. Boyden	3 00
Second, F. J. Kinney	2 00
Third, E. M. Bruce	1 00
Any other variety:	
First, E. M. Bruce, Sutton	3 00
Second, A. E. Hartshorn, Sutton	2 00
Third, F. J. Kinney, Palmer	1 00

WINTER PEARS.—Any variety:

First, George V. Fletcher, Dana's Hovey	3 00
Second, George V. Fletcher, Anjou	2 00

STRAWBERRIES.— One pint:

First, Francis Blake	3 00

Gratuity:—

George C. Rice, Collection of Apples	1 00

CHRYSANTHEMUM EXHIBITION.

NOVEMBER 7, 8, 9 AND 10.

☞ This was the opening exhibition held by the Society in its new halls and includes the postponed **Annual Exhibition of Plants and Flowers** and **Annual Exhibition of Fruits and Vegetables**, which were scheduled for September.

Special Prizes.

Theodore Lyman Fund.

For the heaviest and best ripened bunch of any Foreign Black Grape:

First, George McWilliam, Gros Guillaume	$15 00
Second, George McWilliam, Black Alicante	10 00

Society's Prizes.

FOREIGN GRAPES.—Two bunches Black Alicante:

First, George McWilliam	5 00

Lady Downes:

First, George McWilliam	5 00

Any other variety:

First, George McWilliam	5 00
Second, Mrs. John C. Whitin	4 00

Special Prizes.

Samuel Appleton Fund.

APPLES.—Baldwin, E. F. Locke	5 00
Hubbardston, Artemas Frost	5 00
PEARS.—Bosc, F. W. Damon	5 00
Sheldon, George V. Fletcher	5 00

Benjamin V. French Fund.

APPLES.—Gravenstein, Warren Fenno	5 00
Rhode Island Greening, A. E. Hartshorn	5 00

Marshall P. Wilder Fund.

PEARS.—Anjou:	
First, A. T. Brown	4 00
Second, F. W. Damon	3 00
Third, A. K. Gould	2 00
Fourth, Warren Fenno	1 00
Bartlett:	
First, George V. Fletcher	4 00
Second, Varnum Frost	3 00
Third, J. L. Bird	2 00
GRAPES.—Concord, twelve bunches:	
First, C. F. Hayward	4 00
Second, E. E. Lincoln	3 00
Third, H. R. Kinney	2 00
Worden:	
First, H. R. Kinney	4 00
Second, J. S. Chase	3 00

Theodore Lyman Fund.

APPLES.—Baldwin:	
First, Warren Fenno	4 00
Second, J. C. Stone	3 00
Third, C. H. Teele	2 00
Fletcher Russet:	
First, George V. Fletcher	3 00
Gravenstein:	
First, L. B. Dodge	4 00
Second, J. B. Shurtleff, Jr.	3 00
Third, Mrs. A. E. Underwood	2 00
Hubbardston:	
First, E. F. Locke	4 00
Second, Artemas Frost	3 00
Third, Warren Fenno	2 00
Hunt Russet:	
First, William H. Hunt	3 00
Second, W. H. Teele	2 00
Mackintosh:	
First, George C. Rice	4 00
Second, George V. Fletcher	3 00
Third, H. K. W. Hall	2 00
Maiden's Blush:	
First, H. R. Kinney	3 00
Mother:	
First, Ellwanger & Barry	3 00

Northern Spy:
First, J. Fletcher Stott 3 00
Second, George V. Fletcher 2 00
Third, George C. Rice 1 00
Porter:
First, Mrs. A. E. Underwood 3 00
Second, M. W. Chadbourne 2 00
Pound Sweet:
First, George C. Rice 3 00
Second, George V. Fletcher 2 00
Rhode Island Greening:
First, Warren Fenno 4 00
Second, H. R. Kinney 3 00
Third, A. E. Hartshorn 2 00
Roxbury Russet:
First, A. E. Hartshorn 4 00
Second, H. R. King 3 00
Third, H. R. Kinney 2 00
Sutton:
First, A. E. Hartshorn 3 00
Tolman's Sweet:
First, Artemas Frost 3 00
Second, Mrs. A. E. Underwood 2 00
Third, H. W. Anderson 1 00
Tompkins King:
First, Oliver B. Wyman 3 00
Second, P. W. Costain 2 00
Third, George C. Rice 1 00
Washington Royal:
Second, H. R. King 2 00
Third, A. E. Hartshorn 1 00
Wealthy:
Third, George C. Rice 1 00
Any other variety:
First, George C. Rice, Fallawater 3 00
CRAB APPLES.—Hyslop, twenty-four specimens:
First, M. W. Chadbourne 2 00
Second, A. E. Hartshorn 1 00
Any other variety:
First, S. H. Warren 2 00

Special Prizes offered by the Society.

PEARS.—Anjou, A. K. Gould 5 00
NATIVE GRAPES.—Twelve bunches, any variety, H. R. Kinney . 5 00

Regular Prizes.

PEARS.—Angouleme:	
First, A. T. Brown	4 00
Second, F. W. Damon	3 00
Third, Elbridge Torrey	2 00
Fourth, Warren Fenno	1 00
Bosc:	
First, J. B. Shurtleff, Jr.	4 00
Second, A. T. Brown	3 00
Third, F. W. Damon	2 00
Fourth, Charles W. Libbey	1 00
Clairgeau:	
First, Charles F. Curtis	3 00
Second, Warren Heustis & Son	2 00
Third, F. W. Damon	1 00
Comice:	
First, Warren Fenno	3 00
Dana's Hovey:	
First, A. T. Brown	4 00
Second, F. W. Damon	3 00
Third, Warren Fenno	2 00
Fourth, Warren Heustis & Son	1 00
Diel:	
First, A. T. Brown	3 00
Second, J. C. Stone	2 00
Third, Warren Fenno	1 00
Fulton:	
First, E. S. Converse	3 00
Second, Warren Fenno	2 00
Third, J. L. Bird	1 00
Hardy:	
First, Warren Fenno	3 00
Howell:	
First, Warren Fenno	3 00
Josephine of Malines:	
First, Warren Fenno	3 00
Lawrence:	
First, A. T. Brown	3 00
Second, Warren Fenno	2 00
Third, F. W. Damon	1 00
Louise Bonne of Jersey:	
First, Warren Fenno	3 00
Marie Louise:	
First, Elbridge Torrey	3 00
Second, A. T. Brown	2 00
Third, Warren Fenno	1 00

Merriam:	
First, Charles E. Swain	3 00
Second, Warren Heustis & Son	2 00
Third, Warren Fenno	1 00
Onondaga:	
First, Warren Fenno	3 00
Second, J. L. Bird	2 00
Third, Charles B. Travis	1 00
Seckel:	
First, A. T. Brown	4 00
Second, Mrs. Charles Whittier	3 00
Third, F. W. Damon	2 00
Sheldon:	
First, Elbridge Torrey	4 00
Second, A. T. Brown	3 00
Third, George E. Freeman	2 00
Superfin:	
First, Warren Fenno	3 00
Urbaniste:	
First, A. T. Brown	3 00
Second, J. L. Bird	2 00
Third, M. W. Chadborune	1 00
Vicar:	
First, A. T. Brown	3 00
Winter Nelis:	
First, A. T. Brown	3 00
Second, Warren Fenno	2 00
Any other variety:	
First, Warren Fenno, Pratt	3 00
Second, Warren Fenno, St. Michael Archangel	2 00
Third, Elbridge Torrey, Bezi de la Motte	1 00
QUINCES.—Champion:	
First, L. F. Priest	3 00
Second, Charles S. Smith	2 00
Third, J. S. Chase	1 00
Orange:	
First, George V. Fletcher	3 00
Second, Warren Fenno	2 00
Pear:	
First, George V. Fletcher	3 00
Rea:	
First, J. S. Chase	3 00
Second, I. H. Locke	2 00
Any other variety:	
First, J. S. Chase, Meech	3 00
PLUMS.—Any variety:	
First, H. R. Kinney	2 00

NATIVE GRAPES.—Six bunches of Brighton:	
First, Charles W. Libbey	3 00
Second, H. R. Kinney	2 00
Third, J. S. Chase	1 00
Delaware:	
First, Charles W. Libbey	4 00
Second, J. S. Chase	3 00
Third, H. R. Kinney	2 00
Eumelan:	
Second, J. S. Chase	2 00
Herbert:	
First, Charles W. Libbey	3 00
Second, J. S. Chase	2 00
Lindley:	
First, Charles W. Libbey	3 00
Niagara:	
First, C. F. Hayward	3 00
Pocklington:	
First, H. R. Kinney	4 00
Second, J. S. Chase	3 00
Third, Charles W. Libbey	2 00
Prentiss:	
First, J. S. Chase	3 00
Any other variety:	
First, Charles W. Libbey, Moore's Diamond	3 00
Second, H. R. Kinney, Salem	2 00
Third, J. S. Chase, Diana	1 00
FOREIGN GRAPES.— Two bunches of any variety, cold house culture:	
First, E. S. Converse	5 00
CRANBERRIES.—Half-peck:	
First, L. J. Fosdick	3 00
Second, Charles P. Trowbridge	2 00
Third, A. L. Plimpton	1 00

Benjamin V. French Fund.

APPLES.—Baldwin, A. E. Hartshorn	5 00
Rhode Island Greening, George V. Fletcher	5 00

Society's Prizes.

APPLES.—Baldwin:	
First, F. O. Barrett	3 00
Second, Warren Fenno	2 00
Third, C. H. Teele	1 00
Danvers Sweet:	
First, Warren Fenno	3 00

Fletcher Russet:	
First, George V. Fletcher	3 00
Second, Charles F. Curtis	2 00
Hubbardston:	
First, M. W. Chadbourne	3 00
Second, A. E. Hartshorn	2 00
Third, Warren Fenno	1 00
Northern Spy:	
First, C. W. Morrill	3 00
Second, George C. Rice	2 00
Third, Warren Fenno	1 00
Rhode Island Greening:	
First, Mrs. A. E. Underwood	3 00
Second, A. E. Hartshorn	2 00
Third, H. R. King	1 00
Roxbury Russet:	
First, E. S. Converse	3 00
Second, A. E. Hartshorn	2 00
Third, George V. Fletcher	1 00
Tolman's Sweet:	
First, George V. Fletcher	3 00
Second, Mrs. A. E. Underwood	2 00
Tompkins King:	
First, George C. Rice	3 00
Second, A. E. Hartshorn	2 00
Any other variety:	
First, Mrs. A. E. Underwood, Bellflower	3 00
Second, M. Martin, Bellflower	2 00
Third, A. E. Hartshorn, Sutton	1 00
PEARS. — Angouleme:	
First, Warren Fenno	4 00
Second, A. T. Brown	3 00
Third, J. L. Bird	2 00
Fourth, Edwin A. Hall	1 00
Anjou:	
First, William Milman	4 00
Second, Warren Fenno	3 00
Third, Charles E. Swain	2 00
Fourth, F. W. Damon	1 00
Clairgeau:	
First, Warren Fenno	3 00
Second, A. K. Gould	2 00
Third, J. S. Chase	1 00
Comice:	
First, Warren Fenno	4 00
Second, J. L. Bird	3 00
Third, A. K. Gould	2 00

Dana's Hovey:
- First, M. Sullivan 4 00
- Second, E. W. Wood 3 00
- Third, Warren Fenno 2 00
- Fourth, Warren Heustis & Son 1 00

Diel:
- First, Charles E. Swain 3 00
- Second, A. K. Gould 2 00
- Third, Edwin A. Hall 1 00

Glout Morceau:
- First, Warren Fenno 3 00
- Second, Edwin A. Hall 2 00

Josephine of Malines:
- First, Warren Fenno 3 00
- Second, J. L. Bird 2 00

Langelier:
- First, William H. Spooner 3 00
- Second, A. T. Brown 2 00
- Third, Warren Fenno 1 00

Lawrence:
- First, Charles E. Swain 3 00
- Second, Warren Fenno 2 00
- Third, M. Sullivan 1 00

Vicar:
- First, Mary B. Mendum 3 00
- Second, E. S. Converse 2 00

Winter Nelis:
- First, Warren Fenno 3 00
- Second, A. A. Johnson 2 00
- Third, E. S. Converse 1 00

Any other variety:
- First, William Milman, Mount Vernon 3 00
- Second, Warren Fenno, Bosc 2 00
- Third, Varnum Frost, Bartlett 1 00

QUINCES. — Any variety:
- First, Warren Fenno, Orange 3 00
- Second, E. M. Bruce 2 00
- Third, A. E. Hartshorn 1 00

FOREIGN GRAPES. — Two bunches of any variety:
- First, Mrs. John C. Whitin, Black Alicante . . . 5 00
- Second, Mrs. John C. Whitin, Lady Downes . . . 4 00

Gratuities:—

C. C. Shaw, Collection of Apples	5 00
C. H. Hovey, South Pasadena, Cal., Pomegranates and Persimmons	3 00

E. W. Wood,
Charles F. Curtis,
O. B. Hadwen,
Warren Fenno,
J. Willard Hill,
Sumner Coolidge,
George F. Pierce,

Committee on Fruits.

REPORT

OF THE

COMMITTEE ON VEGETABLES

FOR THE YEAR 1901.

By WARREN HOWARD HEUSTIS, CHAIRMAN.

The exhibitions held during the past year were very successful and in almost every case the prizes have been fully competed for. As a matter of fact, we have, of necessity, to repeat the exhibits from week to week, owing to the limited variety of vegetables during certain portions of the year. At the same time, we get very good specimens and the prizes are quite evenly distributed, no person succeeding in taking prizes on the same variety week after week. The interest displayed on other days than those scheduled for prizes is quite strong and we should be disappointed to see these shows given up. It was stated that we should not be able to get a full exhibit at the new hall, but we were very much gratified to find that we had every foot of space that was allotted us filled, and also had an overflow of vegetables in the basement which would have been a credit to any society, but we are sorry to say that very few people saw them.

There have been no vegetables shown that were superior or deserving of special mention over preceding years, but we would mention six lots of cauliflower grown by four different parties; we think we never saw a more uniform lot.

We are pleased to report that the Executive Committee has seen fit not to reduce the appropriation for the coming year, and we shall endeavor to keep up the usual high standard as in the past. The large exhibits from Worcester and Taunton are very gratifying and prove that where there are prizes to be awarded there will be no lack of competitors.

Five hundred and fifty-seven dollars have been awarded for prizes and gratuities during the past year, leaving a balance of six hundred and forty-three dollars, out of which a Silver Medal and a Bronze Medal are to be paid for.

PRIZES AND GRATUITIES AWARDED FOR VEGETABLES.

1901.

JANUARY 5.

RADISHES.—Four bunches of any variety:

First, A. E. Hartshorn	$3 00

SALSIFY.—Twelve specimens:

First, W. Heustis & Son	3 00
Second, George D. Moore	2 00
Third, A. E. Hartshorn	1 00

CUCUMBERS.—Pair of any variety:

First, Francis Blake, White Spine	3 00
Second, Mrs. John L. Gardner, Telegraph	2 00

CAULIFLOWERS.—Four specimens:

First, DeSouza Brothers	3 00
Second, C. M. Handley	2 00

CELERY.—Four roots:

First, H. R. Kinney, Pascal	3 00
Second, A. E. Hartshorn, Pascal	2 00
Third, W. Heustis & Son, Boston Market	1 00

LETTUCE.—Four heads of Tennisball:

First, Wyman Brothers	3 00
Second, J. C. Stone	2 00
Third, A. E. Hartshorn	1 00

PARSLEY.—Two quarts:

First, W. J. Clemson, Chappell's Matchless	2 00
Second, W. J. Clemson, Moss Curled	1 00

MUSHROOMS.—Twenty-four specimens:

First, H. R. Kinney	3 00
Second, E. S. Converse	2 00

TOMATOES.—Twelve specimens:

First, W. C. Winter, May's Favorite	3 00
Second, Francis Blake, Best of All	2 00
Third, W. C. Winter, Stone	1 00

Gratuities:—

A. E. Hartshorn, Collection	3 00
W. Heustis & Son, "	2 00

FEBRUARY 2.

RADISHES.—Four bunches of any variety:

First, Varnum Frost	3 00
Second, H. R. Kinney	2 00
Third, A. E. Hartshorn	1 00

SALSIFY.—Twelve specimens:

First, George D. Moore	3 00
Second, W. Heustis & Son	2 00
Third, A. E. Hartshorn	1 00

CUCUMBERS.—Pair of any variety:

First, Francis Blake	3 00

CELERY.—Four roots:

First, George D. Moore, Pascal	3 00
Second, H. R. Kinney, "	2 00
Third, W. Heustis & Son, "	1 00

DANDELIONS.—Peck:

First, A. E. Hartshorn	3 00

LETTUCE.—Four heads of Tennisball:

First, Varnum Frost	3 00
Second, Wyman Brothers	2 00
Third, George D. Moore	1 00

MUSHROOMS.—Twenty-four specimens:

First, H. R. Kinney	3 00

TOMATOES.—Twelve specimens:

First, Francis Blake, Best of All	3 00
Second, W. C. Winter, May's Favorite	2 00
Third, W. C. Winter, Stone	1 00

Gratuities:—

A. E. Hartshorn, Collection	2 00
George D. Moore, "	2 00

FEBRUARY 9.

Gratuity:—

W. Heustis & Son, Celery	1 00

FEBRUARY 16.

Gratuities:—

A. Nixon, Celery	1 00
George D. Moore, Collection	1 00

FEBRUARY 23.

Gratuities:—

Wyman Brothers, Lettuce	1 00
W. W. Rawson, Collection	1 00

MARCH 2.

Gratuities:—

George D. Moore, Lettuce	1 00
A. Nixon, Radishes	1 00

MARCH 9.

Gratuities:—

George D. Moore, Lettuce	1 00
W. W. Rawson, "	1 00

MARCH 16.

Gratuity:—

George D. Moore, Lettuce	1 00

SPRING EXHIBITION.

MARCH 19, 20, 21, AND 22.

RADISHES.—Four bunches of Turnip Rooted:	
First, H. R. Kinney	2 00
Second, Varnum Frost	1 00
CUCUMBERS.—Pair of White Spine:	
First, Francis Blake	3 00
Second, E. M. Bruce	2 00
SPINACH.—Half-peck:	
First, Hon. Aaron Low	3 00
DANDELIONS.—Peck:	
First, A. E. Hartshorn, French Thick-leaved	3 00
Second, A. E. Hartshorn, Improved American	2 00
LETTUCE.—Four heads of Tennisball:	
First, George D. Moore	3 00
Second, A. E. Hartshorn	2 00
Third, H. R. Kinney	1 00
WATER CRESS.—Two quarts:	
First, A. E. Hartshorn	2 00
PARSLEY.—Two quarts:	
First, S. J. Goddard, Chappell's Matchless	2 00
Second, A. E. Hartshorn, Moss Curled	1 00
MUSHROOMS.—Twenty-four specimens:	
First, H. R. Kinney	3 00
RHUBARB.—Twelve stalks:	
First, George D. Moore	3 00
TOMATOES.—Twelve specimens:	
First, W. J. Clemson, Frogmore	3 00
Second, W. J. Clemson, Best of All	2 00
Third, Miss M. S. Walker, Essex Hybrid	1 00

Gratuities:—

Hon. Aaron Low, Collection	5 00
W. Heustis & Son, "	5 00
A. E. Hartshorn, "	3 00
W. J. Clemson, "	1 00
George D. Moore, "	1 00

MARCH 30.

Gratuity:—

Hon. Aaron Low, Spinach	1 00

APRIL 6.

BEETS.—Turnip Rooted, twelve specimens:	
First, George D. Moore	3 00
Second, A. Nixon	2 00
PARSNIPS.—Twelve specimens:	
First, George D. Moore	3 00
Second, A. E. Hartshorn	2 00
Third, W. Warburton	1 00
RADISHES.—Four bunches:	
First, A. E. Hartshorn	2 00
Second, W. W. Rawson	1 00
LETTUCE.—Four heads of Tennisball:	
First, George D. Moore	3 00
Second, W. W. Rawson	2 00
Third, Wyman Brothers	1 00
CUCUMBERS.—Pair of White Spine:	
First, Varnum Frost	3 00
Second, E. M. Bruce	2 00
Third, W. W. Rawson	1 00
Any other variety:	
First, Mrs. J. L. Gardner	3 00
Second, E. M. Bruce	2 00

Gratuities:—

Hon. Aaron Low, Spinach	1 00
Mrs. F. L. Ames, Tomatoes	1 00
A. E. Hartshorn, Collection	1 00
George D. Moore, "	1 00
W. Heustis & Son, "	1 00
Wyman Brothers, "	1 00

CHRYSANTHEMUM SHOW.

NOVEMBER 7, 8, 9, AND 10.

☞ This was the opening exhibition held by the Society in its new halls and includes the postponed **Annual Exhibition of Plants and Flowers** and **Annual Exhibition of Fruits and Vegetables,** which were scheduled for September.

ANNUAL EXHIBITION.

SEPTEMBER 26 AND 27.

POTATOES.—Best collection new seedling varieties:

Hon. Aaron Low . . . . . The Society's Silver Medal.

For the second best:

Hon. Aaron Low . . . . . The Society's Bronze Medal.

BEETS.—Twelve Turnip Rooted:

First, E. L. Lewis, Edwards	3 00
Second, W. Heustis & Son, Egyptian	2 00
Third, A. E. Hartshorn, Edwards	1 00

CARROTS.—Twelve Long Orange:

First, A. E. Hartshorn	3 00
Second, W. Warburton	2 00
Third, W. J. Clemson	1 00

Twelve Intermediate:

First, A. E. Hartshorn	3 00
Second, W. Heustis & Son	2 00
Third, Joseph Thorpe	1 00

PARSNIPS.—Twelve Long:

First, A. E. Hartshorn	3 00
Second, W. J. Clemson	2 00
Third, George D. Moore	1 00

POTATOES.—Carmen No. 1:

First, H. E. Rich	3 00
Second, H. W. Anderson	2 00
Third, Hon. Aaron Low	1 00

Clark:

First, H. R. Kinney	3 00
Second, H. W. Anderson	2 00
Third, Hon. Aaron Low	1 00

Early Fortune:

First, H. W. Anderson	3 00
Second, Hon. Aaron Low	2 00

Hebron:

First, F. J. Kinney	3 00
Second, H. E. Rich	2 00
Third, H. W. Anderson	1 00

Rose:

First, H. R. Kinney	3 00
Second, H. W. Anderson	2 00

Any other variety:

First, F. J. Kinney, Sir Walter Raleigh	3 00
Second, Hon. Aaron Low, "	2 00
Third, H. W. Anderson, Snowflake	1 00

SALSIFY.—Twelve specimens:

First, George D. Moore	3 00
Second, W. J. Clemson	2 00
Third, H. R. King	1 00

TURNIPS.—Twelve Flat:

First, Hon. Aaron Low, White Milan	3 00
Second, Hon. Aaron Low, Purple Milan	2 00
Third, Hon. Aaron Low, Purple Strap Leaf	1 00

Swedish:

First, Charles H. Brewster	3 00
Second, H. R. King	2 00
Third, H. R. King	1 00

ONIONS.—Twelve Danvers:

First, E. M. Bruce	3 00
Second, Charles Scully	2 00
Third, W. Warburton	1 00

Red:

First, E. M. Bruce	3 00
Second, A. E. Hartshorn	2 00
Third, H. E. Rich	1 00

White:

First, H. E. Rich	2 00
Second, A. E. Hartshorn	1 00

Any other variety:

First, E. M. Bruce	3 00
Second, E. L. Lewis	2 00

SQUASHES.—Three Bay State:

First, E. L. Lewis	3 00

Hubbard:

First, J. C. Stone	3 00
Second, A. E. Hartshorn	2 00
Third, A. F. Coolidge	1 00

Hybrid Turban:

First, E. L. Lewis	3 00

Marblehead:

First, E. L. Lewis	3 00

Marrow:

First, Varnum Frost	3 00
Second, E. L. Lewis	2 00

Any other variety:

First, E. L. Lewis	3 00
Second, A. E. Hartshorn	2 00
Third, Hon. Aaron Low	1 00

CUCUMBERS.—Pair of White Spine:

First, W. A. Bruce	3 00

Any other variety:

First, W. A. Bruce, Hybrid	3 00
Second, Mrs. J. L. Gardner, Telegraph	2 00

WATERMELONS.—Two specimens:

First, E. L. Lewis	3 00
Second, J. F. Jones	2 00
Third, Joseph Thorpe	1 00

BRUSSELS SPROUTS.—Half-peck:

First, Mrs. J. L. Gardner	3 00
Second, A. E. Hartshorn	2 00

CABBAGES.—Three Drumhead, trimmed:

First, E. L. Lewis	3 00
Second, E. L. Lewis	2 00
Third, A. E. Hartshorn	1 00

Red:

First, H. E. Rich	3 00
Second, E. L. Lewis	2 00
Third, E. L. Lewis	1 00

Savoy:

First, J. C. Stone	3 00
Second, W. Warburton	2 00
Third, E. L. Lewis	1 00

CAULIFLOWERS.—Four specimens:

First, DeSouza Brothers	5 00
Second, C. M. Handley	4 00
Third, H. E. Rich	3 00

CELERY.—Four roots of Paris Golden, best kept during the exhibition:

First, J. C. Stone	5 00
Second, A. E. Hartshorn	4 00
Third, A. F. Coolidge	3 00

Any other variety:

First, W. Heustis & Son, Pascal	5 00
Second, A. E. Hartshorn, Boston Market	4 00
Third, W. Warburton, White Plume	3 00

ENDIVE.—Four specimens:

First, A. Nixon	3 00
Second, A. E. Hartshorn	2 00
Third, E. L. Lewis	1 00

LETTUCE.—Four heads:

First, Varnum Frost, Big Boston	3 00
Second, George D. Moore, Tennisball	2 00
Third, J. C. Stone, "	1 00

PARSLEY.—Two quarts:

First, W. J. Clemson, Matchless	2 00
Second, W. J. Clemson, Champion	1 00

HORSERADISH.—Six roots, present year's growth:

First, H. R. Kinney	2 00

CORN.—Yellow or Field, twenty-five ears, traced:

First, B. P. Winch	3 00
Second, Elliott Moore	2 00
Third, L. C. Linscott	1 00
Sweet, twelve ears:	
First, H. R. King	3 00
Second, Charles Scully	2 00
Third, H. W. Anderson	1 00

TOMATOES.—Twelve Aristocrat:

First, W. Warburton	3 00
May's Favorite:	
First, Hon. Aaron Low	3 00
Second, W. Heustis & Son	2 00
Stone:	
First, Hon. Aaron Low	3 00
Second, Joseph Thorpe	2 00
Any other variety:	
First, Hon. Aaron Low, Enormous	3 00
Second, Hon. Aaron Low, Combination	2 00

PEPPERS.—Twelve specimens of Squash:

First, Hon. Aaron Low	3 00
Second, A. Nixon	2 00
Any other variety:	
First, Hon. Aaron Low, Bull Nose	3 00
Second, Hon. Aaron Low, Ruby King	2 00
Third, Joseph Thorpe, Giant	1 00

CULINARY HERBS, GREEN.—Collection, named:

First, W. J. Clemson	5 00
Second, W. Warburton	4 00

NOVEMBER 10.

PARSNIPS.—Twelve specimens:

First, Varnum Frost	3 00
Second, A. E. Hartshorn	2 00
Third, H. R. King	1 00

SALSIFY.—Twelve specimens:

First, Varnum Frost	3 00
Second, H. R. King	2 00

CUCUMBERS.—Pair:

First, E. L. Dorr	3 00
Second, E. L. Dorr	2 00
Third, Mrs. J. L. Gardner	1 00

CABBAGES.—Three Red, trimmed:

First, A. E. Hartshorn	3 00
Second, H. E. Rich	2 00

Savoy:

First, A. E. Hartshorn	3 00

Brussels Sprouts.—Half-peck:

First, A. E. Hartshorn	3 00
Second, A. E. Hartshorn	2 00
Third, C. W. Parker	1 00

Cauliflower.—Four specimens:

First, C. M. Handley	3 00
Second, W. H. Teele	2 00
Third, DeSouza Brothers	1 00

Celery.—Four roots:

First, Joseph Thorpe	3 00
Second, W. Heustis & Son	2 00
Third, A. F. Coolidge	1 00

Lettuce.—Four heads:

First, Varnum Frost	3 00
Second, A. E. Hartshorn	2 00

Tomatoes.—Twelve specimens, grown under glass:

First, W. C. Winter, Combination	3 00
Second, W. C. Winter, Stone	2 00
Third, E. L. Dorr, Essex	1 00

Gratuities:—

N. W. T. Knott, Gourds	1 00
C. W. Parker, Display	2 00
E. L. Lewis, Collection	10 00
W. J. Clemson, "	5 00
A. F. Coolidge, "	5 00
W. Heustis & Son, "	5 00
Hon. Aaron Low, "	5 00
George D. Moore, "	3 00
A. Nixon, "	5 00
W. Warburton, "	5 00

Warren Howard Heustis,
Cephas H. Brackett,
Varnum Frost,
Walter Russell,
Aaron Low,
George D. Moore,
Joshua C. Stone,

Committee on Vegetables.

The Gov. Oliver Ames Estate at North Easton.

REPORT

OF THE

COMMITTEE ON GARDENS

FOR THE YEAR 1901.

By PATRICK NORTON, CHAIRMAN.

Your Committee has been very active during the year just closing, and has visited a large number of places, and the knowledge thus gained of the different methods employed in the cultivation of plants will be useful not only to the Committee, but to all who read this report. We will take the places visited in rotation, and describe in as brief a manner as possible the later or newer methods adopted to bring about the success each grower aims to accomplish.

W. W. RAWSON'S LETTUCE HOUSE, ARLINGTON.

The first place visited (February 21, 1901) was that of W. W. Rawson at Arlington, who has thirty-five large greenhouses and two thousand sashes of hotbeds, mostly devoted to the growing of lettuce, radishes and cucumbers for the market. Here we saw for the first time the process of sterilizing the soil in which the plants were grown. This process is no doubt a great benefit, as the immense steam heat which permeates every portion of the soil kills all germs of fungi deleterious to plants and all seeds of weeds as well, thus leaving the soil in splendid condition for a year's cultivation. This process is to be commended.

Lettuce plants were in all stages of development, from the planted seeds just appearing above ground to the large perfect heads ready for market. The house we were asked to scrutinize

was four hundred feet long and fifty feet wide and contained thirty-seven thousand plants averaging over one foot in diameter, a remarkable showing of splendid plants. Another house containing cucumbers was very fine, and the plants very vigorous and heavily set with fruit.

Peter Fisher's Carnation House, Ellis.

The second place visited (March 14, 1901) was that of Peter Fisher, at Ellis. His specialty is the growing of carnations. He had several houses of these plants, and in some of them he was testing the qualities of the best plants sent out by different growers, and also, to a greater extent, testing numerous seedlings of his own production. He is a very enthusiastic cultivator of carnations and has put upon the market the best one yet produced in America; wherever it has been exhibited it has taken first prize over all others, and when we saw it growing on the benches we ceased to wonder at its success. The house entered was three hundred and two feet long by twenty-three feet wide and presented the finest appearance of any house of carnations your Committee ever saw. The flowers and buds were more numerous and the expanded flowers were larger and of more perfect shape and color than any we ever saw before. There were no expanded flowers in the house that would measure less than three inches in diameter, and from that up to four inches, with upright stems holding the flowers in a presentable condition.

Mr. Fisher submits a description of his principal house for growing carnations, as follows:

House of modern construction, three hundred and two feet long, twenty-three feet wide, and twelve feet high to ridge running north and south. Continuous ventilators each two feet wide, on both sides of ridge. Benches five feet wide, lengthwise of house, with a walk eighteen inches wide next to walls. Benches rest on three-quarter inch iron pipe. Woodwork, cypress. Glass, 16 x 24. Cement walls, in which are set one and one-half inch iron posts to sustain the structure.

Compost consists of sods from old pasture, well rotted, with a liberal addition of ground bone, lime and stable manure in about equal quantities. The plants were transferred from the open

Peter Fisher's Carnation House at Ellis. The Mrs Thomas W. Lawson Carnation.

ground to the benches about the middle of August, and the first stimulant was given late in November, in the form of a light top dressing composed of half soil, and half pulverized sheep manure and bone meal. Air-slaked lime was freely applied when the soil showed signs of becoming sour.

The temperature was 52° to 55° during the night, with a rise of 15° to 20° during the day.

The principal crop consisted of:

3,000	plants	Mrs. Thomas W. Lawson,
1,000	"	Maine,
1,000	"	Eastern Star,
500	"	The Marquis,
500	"	Mrs. George M. Bradt.

Steam was used for heating the house with four one and one-quarter inch pipes on each side and one one and one-quarter inch pipe under each bench.

Mr. Fisher entered for the best House of Carnations.

Mrs. David Nevins's Estate, Methuen.

The next visit which occurred on June 20th, was to the beautiful old estate of Mrs. David Nevins, at Methuen. This estate, occupied by the ancestors of Mrs. Nevins in the eighteenth century, was now undergoing extensive repairs and improvements, but the admirable features of the old mansion were being preserved. The shrubbery, which forms one of the great charms of the place, was in splendid condition, owing principally to the unremitting vigilance of the owner. The place is surrounded by noble elms interspersed with clumps of fine shrubbery, and the Spicket River, flowing through velvety green banks on one side of this estate, makes it a very attractive homestead, while the view from the summerhouse over an expanse of meadow and far away, gives a charm of restful pleasure to the place not exceeded anywhere.

Warren H. Heustis's Strawberry Garden, Belmont.

On June 26th the Garden Committee visited the fruit and vegetable farm of Warren H. Heustis, at Belmont, to inspect his strawberry garden and to pass upon the quality of the fruit. It

would appear that Mr. Heustis cannot any further improve upon the size or quality of strawberries, for those we saw and tested were as near perfection as they can be grown in this part of the country; expert growers from other towns were of the same opinion as your Committee. The kinds mostly cultivated were the Marshall and Belmont. The latter originated on this farm, and still retains the good keeping qualities, large size and fine flavor it had when first shown. We congratulate Mr. Heustis on knowing how to grow good strawberries.

GEORGE D. MOORE'S CUCUMBER HOUSE, ARLINGTON.

On June 27th we visited Arlington to inspect a house of cucumbers as grown by George D. Moore & Son. The house was two hundred and forty feet long by thirty-five feet wide, and contained about six hundred plants well set with fruit and in vigorous health. From the good condition of this house we infer that these people have not forgotten how well their house looked two years ago, and, taking that as their standard of excellence, have this year fully equaled their pattern. The vegetable garden was of the usual type of the market gardener, and showed good cultivation and a very thrifty appearance. We append Mr. Moore's letter giving his method of growing crops.

PATRICK NORTON, *Chairman Committee on Gardens*;

DEAR SIR: — Complying with your request to make a statement concerning methods pursued in reaching the high state of cultivation in which you found my farm or market garden when visiting me last summer, let me say to start with that this subject has been so frequently and ably treated by those better qualified than myself to write upon it, that I hesitate to attempt to make you a statement fearing that I shall fail to do either myself or the subject justice. But as you have awarded me the first premium it is but just that you should demand of me some explanation of the methods pursued. So I will briefly tell my story.

To begin with I am largely indebted to a generous water supply. In the fall of 1900 I secured the services of Morton & Waugh of Boston to provide me a water supply that would furnish enough, not only for my four large greenhouses and one thousand hotbed sashes, but for ample outside irrigation in my seventeen acre garden; to say they fully succeeded hardly does them justice for of the four two and one-half inch wells put down

The Gov. Oliver Ames Estate at North Easton.

(one struck a rock and was abandoned), three at the depth of fifty to sixty feet furnished a bounteous supply of the purest and best of water. A Dean steam pump of four inch suction, throwing nearly two hundred gallons per minute night and day enabled us to water thoroughly both the crops and the land before planting; also to wet down the fresh strawy horse manure as brought from city stables forcing the rotting, and aiding its preparation for the soil.

On much of my land I raise two or three crops, sowing early spinach and as soon as the ground is in condition to cultivate there follows a crop of beets with every fifth row left for celery; or, I plant the early beets for a first crop, carefully preparing the soil by plowing and harrowing, then a fair dressing of stable manure is lightly plowed in and well rotted if possible, supplementing the manure by one-half a ton to the acre of some reliable phosphate (we have found nothing better than Bowker's or Stockbridge Specials). I rake this in thoroughly after the last plowing. This is practically my method with all crops except tomatoes, parsnips, carrots etc.; these crops do not need fertilizing so liberally. If at any time you wish me to give you a statement of my management of hotbeds, or a more minute explanation of my treatment of any special outside crop, please command me.

GEORGE D. MOORE,
M. ERNEST MOORE, *Proprietor and Manager.*

ESTATE OF H. H. ROGERS, FAIRHAVEN.

The sixth place visited was that of H. H. Rogers, at Fairhaven. This estate is entered in competition for the H. H. Hunnewell Triennial Premium, and this was the Committee's first visit. It consists of eight acres of reclaimed land on the borders of the sea which separates Fairhaven and New Bedford. The situation is very much exposed to the winds from the ocean, but the caretaker, Mr. James Garthley, has so judiciously laid out the grounds and carefully planted the trees, shrubs and flowers as to make it a beautiful home for the owner.

THE OLIVER AMES ESTATE.

On August 13th the Committee was called to view the Oliver Ames estate, at North Easton. This estate is entered for the H. H. Hunnewell Triennial Premium, by Mr. Oakes Ames, son of the late Governor, and this is the third year of inspection. The

whole estate was in very fine condition. The grand old trees, which were planted by the late Governor of this Commonwealth, were in better condition than ever before, and their appearance indicated that they were receiving the kind care essential to good healthy growth. The lily ponds were resplendent with blooms of all sorts of aquatics from the four quarters of the globe, and presented a grand appearance. This estate shows not only the constant change going on in the vegetable products that are being gathered from all parts of the world for scientific and ornamental purposes but accessions are continually being made by importations and Mr. Ames's own hybridizations, thus making the place actually a botanic museum of living plants.

Estate of C. H. Tenney, Methuen.

On September 27th we visited "Greycourt," the regal estate of C. H. Tenney, at Methuen. This estate was entered for the H. H. Hunnewell Triennial Premium, and this is the second year of entry. The last year's Transactions, Part II, contains a photograph of this estate which appeals to the eye better than any language can portray its beauties. Mr. Tenney is constantly improving his ground by judiciously cutting out trees and shrubs where they have grown so large as to interfere with each other, thus giving the more valulable one room to expand and also a longer lease of life. He is also constructing on the north side of the hill on which the house stands a splendid bowling green, the first in New England, with all the accessories to make the sport of bowling on the turf a pleasant and agreeable exercise and a joy forever to those who believe in athletic sports.

W. P. Lothrop's Dahlia Garden, East Bridgewater.

The next visit, which occurred on September 30th, was to the dahlia farm of W. P. Lothrop, East Bridgewater. This farm consists of four acres and was planted with about four hundred varieties of dahlias — growing from twenty thousand hills. New varieties of special merit are constantly being added and sixty new kinds were acquired this year. They are of every conceivable description, but it seems that the variety described as the

The Chrysanthemum House of Hon. E. S. Converse, Malden.

Cactus dahlia is the most sought for. Mr. Lothrop planted a bed of four hundred plants at the Paris Exposition last year and received for the display a medal. The roots will be stored during the winter, packed in dry sand.

Waban Rose Conservatories, Natick.

On Monday, November 4th, the Committee visited the extensive Waban Rose Conservatories at Natick. The whole plant is under the care of Alexander Montgomery, and when we say this and have seen the contents of the houses, we know that Mr. Montgomery understands how to grow roses. The rose bushes were perfectly free from insects and mildew and presented the finest show of buds and flowers conceivable. Only a few kinds were grown, and those were the ones most sought for by dealers; they consisted of The Bride, Bridesmaid, American Beauty, Morgan, Liberty, Madame de Watteville and Helen Gould. Some of the houses contained sixty-five hundred plants, and when we looked over the beds of luxurious bloom seven hundred feet in length we began to wonder where all the roses go to, but these were so well grown and splendidly finished that there was no difficulty in disposing of all at remunerative prices. The Proprietors contemplate building another house seven hundred and fifty-two feet long by fifty-two feet wide, in the near future, so as to enable them to grow a few more roses.

Estate of Colonel Charles Pfaff, South Framingham.

The next visit was to the elegant estate of Colonel Charles Pfaff, South Framingham, on November 4th, to inspect a house of chrysanthemums grown on benches. Six hundred and fifty plants comprising seventy varieties, with one flower on each plant were a beautiful sight, and the gardener, Mr. George Melvin, was complimented by the Committee for his efficiency in producing such fine blooms.

Estate of E. S. Converse, Malden.

On November 5th the Committee visited the estate of The Hon. E. S. Converse, at Malden, to inspect his two chrysanthemum

houses in which the plants are grown in pots and arranged with other plants for effect. This plan makes the houses look beautiful, and the gardener, Mr. D. F. Roy, has certainly accomplished the object striven for. The chrysanthemums were arranged on each side of the path lengthwise of the houses, with handsome foliage plants intermixed. The standard chrysanthemum plants were placed at stated intervals, which added very materially to the beauty of the houses.

Mrs. A. W. Spencer's Chrysanthemum House, South Framingham.

On November 6th the Committee was called to inspect a house of chrysanthemums grown on benches by Alexander McKay, gardener to Mrs. A. W. Spencer, of South Framingham. There were in this house four hundred plants in sixty-two varieties, grown to one flower each. The flowers were splendidly grown, of very large size and well finished.

Estate of Frederick Parker, Bedford.

On the 13th of November the Committee visited the Shawsheen River Farm of Frederick Parker, at Bedford, to inspect crops of cucumbers, tomatoes and lettuce. There were three houses, three hundred feet long by thirty-six feet wide, each of which would contain nineteen thousand four hundred and forty-eight plants of lettuce. One of these houses was used for propagating seeds of all kinds till late in the spring, when it was planted to cucumbers. Two other houses, three hundred and fifty feet long by thirty-six feet wide, each contained twenty-two thousand four hundred and forty lettuce plants nearly ready for the market. Another house of lettuce was three hundred and thirty feet long and thirty-six feet wide and contained twenty-one thousand, seven hundred and thirty-six lettuce plants. In another house were growing three hundred and eighty hills of cucumbers, set two and one-half feet apart; these were not a great success, although a fair crop had matured and was being harvested.

The tomato house was one hundred and forty-six feet long by thirty-six feet wide, and contained five hundred and sixty-eight

plants in the most flourishing state of any tomato house we ever saw. The seed was sown on the 8th of July, and when the plants were large enough to handle they were potted into small pots; as the plants grew and filled the pots with roots, they were "potted on" till the first fruit was set, then transferred to the fruiting beds in the house, which were sixteen inches deep and very rich. Here they were trained to one stem and showed more fruit than any house we ever saw. The first picking began in early November. The variety was Henderson's Freedom. Our attention was called to a small house twenty-five feet long by twenty feet wide, which was full of tomato vines and had been planted nearly one year and was now showing a fair crop of fruit. The soil used in these houses was thoroughly sterilized and the rotation generally followed was three crops of lettuce and a crop of cucumbers. The whole plant was in fine condition and reflected very much credit on Mr. C. A. Learned, the manager.

R. & J. Farquhar's House of Begonia Gloire de Lorraine, Mount Hope.

The last place visited was at Mount Hope. The greenhouses belong to R. & J. Farquhar & Co. and William Donald is manager. The object of our visit was to inspect a house of begonias of the Gloire de Lorraine type. This house contained more than ten thousand plants of all sizes, and presented a grand appearance. There were the original pink, the newer white Caledonia, and the Compacta, a new variety originated here. These plants were grown at as cool a temperature as possible, so that they would withstand being transferred to dwelling houses. They make very handsome house plants for they are always in bloom. The Committee did not confine themselves to admiring the begonias, but strolled over the different houses and got some ideas of what Mr. Donald was trying to accomplish. His palm house was very fine and contained palms of all ages and sizes. Probably the most useful work Mr. Donald is doing is the propagating of a new rose originated by Jackson T. Dawson. This rose is a cross between the Wichuraiana and the Crimson Rambler, both of which are runners, but this new Farquhar rose will excel them

both in this respect. During the past four months over a thousand plants have been propagated, but they will not be put on the market till a large stock is accumulated. This rose is getting a splendid reputation from eminent gardeners who have seen it in bloom.

The Farquhars are preparing to erect more glass houses early in the spring, to accommodate their ever increasing business.

The Prizes and Gratuities awarded this year, are as follows:

H. H. Hunnewell Triennial Premium.

For an estate of not less than three acres, which shall be laid out with the most taste, planted most judiciously, and kept in the best order for three consecutive years,
First, The Oliver Ames Estate $160 00

Special Prizes from the John A. Lowell Fund.

For the best house of Chrysanthemums grown on benches:
First, Mrs. A. W. Spencer 30 00
Second, Col. Charles Pfaff 20 00
For the best House of Chrysanthemums with other plants arranged for effect, in pots:
First, E. S. Converse 30 00
Second, E. S. Converse 20 00

Society's Prizes.

For the best House of Carnations:
First, Peter Fisher 30 00
For the best House of Roses:
First, Waban Rose Conservatories, American Beauties . . 30 00
Second, Waban Rose Conservatories, Assorted Teas . . 20 00
For the best Vegetable Garden:
First, George D. Moore & Son 30 00
For the best House of Lettuce:
First, W. W. Rawson 30 00
Second, Frederick Parker 20 00
For the best House of Cucumbers:
First, George D. Moore & Son 30 00
For the best Strawberry Garden:
First, Warren H. Heustis 30 00

The Gov. Oliver Ames Estate at North Easton.

Gratuities.

Mrs. David Nevins, Estate	25 00
W. P. Lothrop, Dahlia Garden	20 00
R. & J. Farquhar & Co., House of Begonia Gloire de Lorraine	25 00
Frederick Parker, House of Tomatoes	25 00
C. A. Learned, Superior Cultivation of Tomatoes under glass	Silver Medal

Respectfully submitted,

PATRICK NORTON,
ARTHUR H. FEWKES,
J. WOODWARD MANNING,
E. W. WOOD,
WARREN H. HEUSTIS,
J. H. WOODFORD,
JACKSON T. DAWSON,
HENRY W. WILSON,

Committee on Gardens.

REPORT

OF THE

Committee on School Gardens and Children's Herbariums

FOR THE YEAR 1901.

By HENRY LINCOLN CLAPP, CHAIRMAN.

Even a brief consideration of the work for which this Committee stands will take us not only out of Massachusetts but out of New England as far as the Central States where we may find an extraordinary example of what may be done in training boys to habits of industry, teaching them to respect the rights of others, and making them instrumental in improving their neighborhood on a vast scale.

BOYS' GARDENS IN DAYTON, OHIO.

The boys' gardens established by the National Cash Register Company deserve a more extended notice than can be given in this report. There were forty gardens last year, but the increased demand necessitated seventy-four plots this year, each ten by one hundred and thirty feet in size, two and one-fifth acres in all. The cost of the land and the cultivation of it one year was $3500. The boys average about twelve years of age, and complete the course in gardening in two years, when each receives a certificate to the effect "that ——— has been instructed in the National Cash Register Company's Garden Work, and has been faithful and proficient in the same."

The certificates are signed by Mr. J. W. Patterson, the president of the Company. His own two children, Frederick and

Dorothy, as well as his nephew and niece, are also proficient in gardening, showing that what he believes to be good for other children he thinks is just as good for his own. He thinks it is possible for boys to go to school too long and so become bookish and out of touch with the active business world; and he rates his experience on the farm more valuable than anything he ever learned at school, valuable as the latter undoubtedly was.

The result of this garden work has been most extraordinary. Slidertown was one of the worst parts of the city; now it is one of the very best, and its change of name to South Park is indicative of the change wrought in every condition. Three of the worst boys were gotten rid of, and "the rest were formed into clubs and brigades, and were given gardens and taught to respect themselves and the rights of others." Then land rose from $300 a lot to three times that amount; and the $3500 put into the garden work carried on by the boys is said to be the best investment for the money that the Company ever made.

In spite of the strike among the ungrateful employees of the Company and the long droughts a great amount of garden stuff was raised; namely, 814 dozen onions, 1332 dozen radishes, 962 dozen beets, 1258 dozen carrots, 481 dozen ears of sweet corn, 9 bushels of seed onions, 56 bushels of peas, 74 bushels of wax beans, 62 bushels of butter beans, 79 bushels of potatoes, 111 bushels of tomatoes, 9 bushels of sweet potatoes and 2590 heads of cabbage.

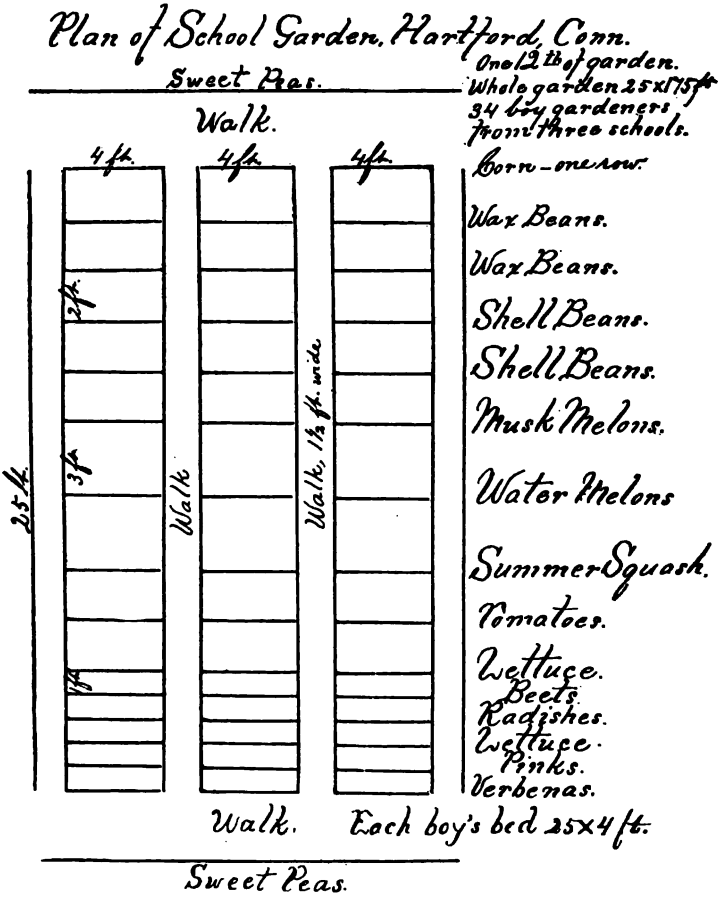
The land, tools, seeds and instructor were furnished by the Company. Most of the boys supplied their families with vegetables during the summer, and many earned enough money by the sale of vegetables not needed at home to pay for their school books.

The boys were given a supper, ten money prizes amounting to $35, five prizes each in the form of the Youth's Companion for a year, bronze medals and a stereopticon lecture by the president, Mr. Patterson.

Such an example is most worthy of imitation by other companies and associations having in view the uplifting and proper training of boys.

SCHOOL GARDENS, SCHOOL OF HORTICULTURE, HARTFORD, CONN.

The principals of three public schools selected ten boys apiece to work the beds prepared for them. The boys were furnished with tools, seeds, plants to set out, four-foot measuring sticks, twelve inch labels for the beds, note-books, pencils, etc. The number on the bed label corresponded with that on the note-book. In the note-book each boy drew a plan of his plot, wrote out the



directions he received as to how his seeds should be planted and his plants cared for, and kept his attendance.

If a boy was absent twice in succession without excuse he ran the risk of losing his garden, as there were always plenty of boys on the waiting list ready to take forfeited gardens. Sixty-five per cent of the gardens did not change hands. Three of the beds changed three times apiece. Six of the delinquents said it was too far; two got tired; and two were delinquent even on excuses. Several boys had to come two or three miles, and a few of these never missed a lesson. Some of them stuck to their work although on three occasions it rained at intervals of a few minutes — and besides it was on Saturday when they worked. That showed commendable zeal.

The whole cost of the garden work (not including instruction and rent of land) was $47.33. The Civic Club voted to appropriate $25 in prizes for the following products: $1.00 each for the three best gardens, three best books, best ear of corn, vine of shell beans, vine of wax beans, beets, tomatoes, summer squash, watermelons and musk melons, bunch of verbenas, bunch of radishes and best essay of one hundred words on garden work, with second prizes for some of the things.

The judging was done by two prominent and competent men, Mr. George A. Parker, Superintendent of Keney Park, and Mr. Theodore Wirth, Superintendent of City Parks.

The nineteen boys who won prizes made an exhibit of the vegetables they had raised; and with the eatables to look at, the speeches to listen to, and the prizes to carry off, the occasion was an enjoyable one for the boys.

As a result of the summer's work the Committee says: "One of the churches here in the city has already cleared up an unsightly back yard, put up a new fence, plowed the ground, and proposes to have a class of the older Sunday School boys work in the garden thus formed and grow flowers for the use of the church and the sick.

"If the boy's time thus taken kept him usefully employed when he might otherwise have been running the streets or sowing the seeds of future crime, if he received lessons in industry, if he has

learned things that will be of use to him later in life, if his health has been improved by being in the open air, if a love of things beautiful and a desire to search the mysteries of nature have been awakened within him; if he is better able to see what he looks at and understand what he sees, he will be broader in view and a better citizen, and his work in the allotment garden will not have been in vain."

SCHOOL GARDEN, BATH, MAINE.

MR. HENRY L. CLAPP,

DEAR SIR: The generosity of your Committee enabled me to add to our school garden the following plants:

Adiantum pedatum,
Aspidium Filix-mas,
Asplenium platyneuron,
Aquilegia oxysepala,
Aster alpinus,
" *Chapmani*,
" *lævis*,
" *Sibiricus*,
Cypripedium pubescens,
" *spectabile*,
Onoclea Struthiopteris,
Sanguinaria Canadensis,
Spiræa lobata,
Viola Alpestris,
" *pubescens*,
" *rostrata*.

The garden has been used by the botany class more this year than in any previous years. The pupils made a careful study of the plants as they appeared. They recorded the growth from day to day and made many good drawings of the plants in their various stages. Much interest was shown in the ferns, of which there are at present twenty species.

Very truly yours,

VIOLA G. HOGAN.

SCHOOL GARDEN OF THE TWENTIETH CENTURY CLUB, BOSTON.

Last spring (1901) a school garden containing eighty-two beds was established in the yard of the English High School on Dartmouth Street, Boston. It has been given the above title because two lady members of the Club were foremost in establishing it and

the Club paid the expenses of it,—$50 to the gardener, $25 to the young lady who instructed the pupils during the summer vacation, and $17 for preparing the ground, laying out the beds for planting and miscellaneous expenses—$92 in all. Some tools and seeds were given by Joseph Breck & Sons.

Boys from the Rice School and girls from the Franklin School in about equal numbers, enjoyed the privilege of raising vegetables and flowers in this garden. The girls of the Normal School received instruction in garden work last summer in this garden instead of instruction in geology which they have had in previous years. So those who are preparing to teach will be equipped with the theory and practice of raising vegetables and flowers. That is an excellent beginning in the right place and in the right way. It must be borne in mind that there is behind this enterprise a club with money and meaning business. Thirteen dollars' worth of photographs of the garden is one indication of an intention to do a good thing even if it does cost a little money. The Club will bear the expenses of the garden another year, at least.

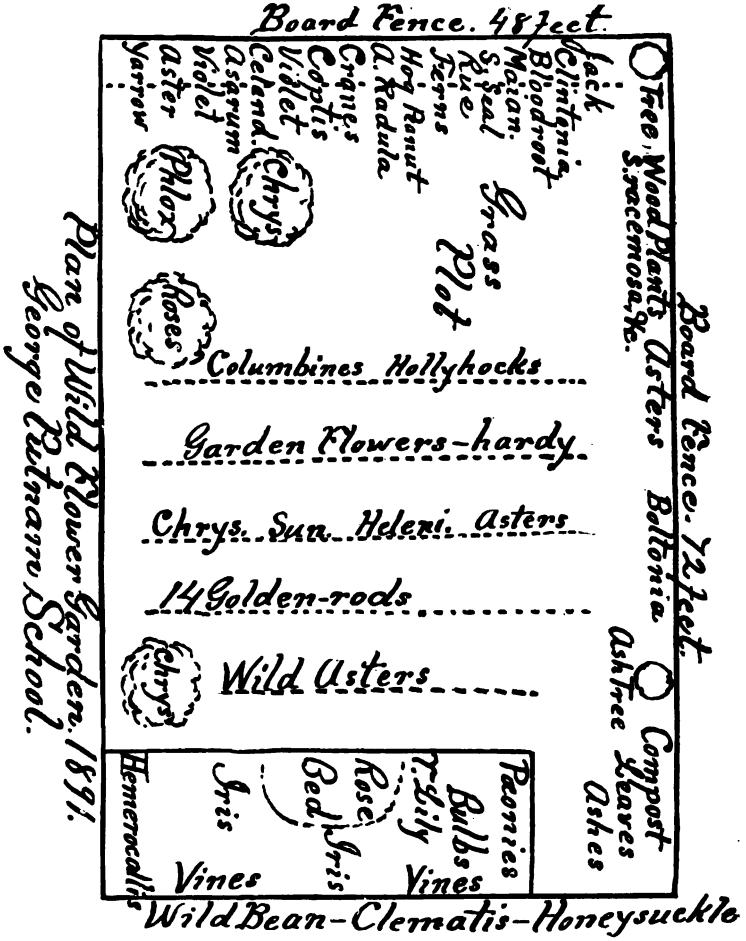
THE GEORGE PUTNAM SCHOOL GARDEN, BOSTON.

The second season of the kitchen garden on the grounds of the George Putnam School closed about November 1, 1901, when the pupils finished planting their bulbs for spring blooming. Here is a garden with more beds (eighty-four) than any other garden yet mentioned, which was laid out without expense to any one outside of the school, as a friend ploughed it free of charge and the children made all the beds out of the rough field of sods. They bore the expense of tools and seeds and did all the work. There were no special inducements to ensure faithful work—I wish there might have been—nevertheless, some of the pupils came regularly every week on Monday afternoon without any adult to meet and instruct them, and did not allow a single weed to be seen in their beds. They watered their plants when necessary, carried home lettuce, radishes, corn, kohl-rabi, beets, and other vegetable roots and flowers, and had their beds looking "spick and span" when the school opened in September. They just loved to do it. One

girl wrote in her composition that she preferred gardening to anything she studied in school; and yet she was a good scholar.

There were many delinquents. No doubt some were constitutionally weary; some decided that a vacation was a very improper time to double up one's back like an inch-worm in order to pull weeds; some of them could run like hares on the "gridiron" and drip with sweat without thinking of it. But when school opened, delinquents and all took hold and eradicated all the weeds, perambulated with the water pots, straightened the beds and paths,

squinted with one eye half open, and put their wits to work generally. In a short time the existence of weeds during the summer would never have been suspected by the casual observer.



During October there was a fine display of hardy chrysanthemums, some red and some yellow, and sneezeweeds (*Helenium autumnale*) which had been planted by the hundreds in the pre-

ceding spring. Generally each pupil had a red chrysanthemum in one end of his bed, and a yellow one in the other, and a sneezeweed in the middle. Since all blossomed profusely the garden was glorious with color.

As usual the material in the wild flower garden, which was begun in 1890, (see plan on opposite page), has been used in school in nature study and designing. A number of lantern

Pupil's Surface Design from Columbine, George Putnam School.

slides of designs based on the sneezeweed have been made. Many photographs of the pupils engaged in garden work have been taken, and half-tone prints from them are expected to appear as illustrations of an article on "A Boston School's Kitchen Garden" in the June number of the New England Magazine.

It may be mentioned in this connection that one hundred reprints of the article will be sent and given to persons interested in following out the work of this Society. Just a year prior to

the appearance of the article just mentioned, or in May, 1901, the Chairman of the School Garden Committee wrote a sixteen page article on school gardens for the monthly magazine "Education" and had two hundred reprints struck off for distribution in preference to receiving cash for remuneration. The work is meritori-

Composite Flowers in Wild Flower Garden, George Putnam School.

ous enough to warrant the expenditure of time and skill in writing, photographing, lantern-slide making and actual currency of the nation.

INTEREST IN SCHOOL GARDENS INCREASING.

Immediately following the last Herbarium Exhibition this appeared in the editorial columns of the Transcript: "It does not seem that any statement should be necessary to show the ad-

vantages of school gardens. Besides training habits of observation, garden work keeps children off the streets, cultivates habits of industry and respect for other people's gardens, gives the children a love of nature and turns their attention toward the blessings of out-door life as an offset to the strong current toward the life of the shops and the tenements. Window gardens in the home follow school gardens, and bring added sweetness to life. If the masters of the Boston schools would make more effort in this direction and were better supported by a Board of Education working in sympathy with the Massachusetts Horticultural Society, the children of the public schools would learn something that would be of quite as much value as much that they learn from books, and the city and the Commonwealth would be the gainers."

Interest in school gardens is increasing. Educators are beginning to appreciate the educational value of raising plants. The Educational League has published a leaflet on a German school garden. George Henry Knight of New York, wrote an article on the subject which came out in Pearson's Magazine last year; and he wrote me that he is going to publish another, and I have sent him some photographs to illustrate it. Dr. F. M. Powell, Superintendent of the Institution for Feeble-Minded Children in Glenwood, Iowa, is also writing a monograph on the subject, and I sent him four of the half-tone cuts that illustrated the report of our Committee last year. A number of women teachers, to my knowledge, are going to talk on the subject before clubs in Boston and vicinity. I had the pleasure of showing about sixty lantern slides of children at work in the school garden before the Boston Society of Natural History, December 18, 1901. In view of such indications as these there is no doubt that the subject is increasing in popular estimation.

CHILDREN'S HERBARIUMS.

Since there was considerable uncertainty as to whether the hall in this building would be ready for exhibition the Committee made less effort than usual to secure a large exhibit of herbariums; but they came just the same in unexpected numbers. Additional sat-

isfaction was found in the attendance of an unusual number of children, a fact that could not be accounted for at first thought. Then came the idea that the hall was situated in a residential district, and all was plain. This promises well, not only for herbarium exhibitions but for all other kinds of exhibitions.

The exhibitors came in families, so to speak, more than in any previous year. There were three Murdoch boys, three Morss boys, two Swain boys, two French girls and two Clapp girls. For years past it has been noticed that the family interest in herbarium work has been much greater than any school interest; and so slight has the latter been that the Committee have decided to give up that part of their work and turn their attention to the encouragement of family interests. There seem to be dead weights on the schools so far as anything besides books is concerned. There are two probable reasons for this condition. Teachers generally are not yet sufficiently acquainted with wild flowers to have enough interest in herbarium work to induce their pupils to make herbariums. The past ten years' experience shows that individual parents have much more interest and efficiency in bringing about results in herbarium work than teachers. Secondly, the requirements of the course of study, are so exacting as to leave neither place nor time for collecting, pressing and mounting plants. So the case seems to be a hopeless one for public school children.

The most notable collection was that sent in by Dorothea Metcalf. The beauty of the arrangement of the plants and the preservation of their colors were far beyond anything else in the hall. Her parents were found to be enthusiastic in the work. And this attitude of the parents has been found to be so uniform through years that the Committee have come to rely upon it as a permanent thing, and to base all their hopes upon it.

Olive French's collection of fifty grasses and Christine Dudley Clapp's collection of leaf sprays were easily the best of their kind on exhibition. The mothers of these girls are deeply interested in their work. Olive's brother, Arthur, who exhibited so many years, is a skillful botanist, although still in his teens. And the little Marion French is coming along the same line.

The opportunity thus presented to children by the Massachusetts

Horticultural Society is certainly a great one. The Committee hold it in higher and higher esteem as the years go on; and the children and their parents seem to be of the same mind.

The Committee have decided to make one radical change in their awards for herbariums; that is, to pay a definite sum for every specimen that comes up to the standard. This simplifies the work very much, and allows exhibitors to make additions many years without requiring the Committee to attempt the difficult task of determining a just award in view of all the plants that the exhibitor may have entered in previous years. Inducements for entering lichens and mosses have been made by offering a definite sum as indicated in the circular.

PRIZES AND GRATUITIES AWARDED FOR SCHOOL GARDENS AND CHILDREN'S HERBARIUMS.

SCHOOL GARDENS.

George Putnam School, Roxbury, first prize	$15 00
Gratuity:—	
High School, Bath, Me.	5 00

CHILDREN'S HERBARIUMS, NOVEMBER 30, 1901.

FLOWERING PLANTS.—For one hundred specimens:	
First prize, Dorothea Metcalf	$4 00
For twenty-five specimens:	
First prize, Donald N. Swain	1 50
Gratuities:—	
John Murdoch, Jr., eighty additions to four hundred and fifty	4 00
Joseph Murdoch, ninety-one additions to one hundred and sixty-seven	3 50
Richard Murdoch, ninety-four additions to one hundred and ten	3 00
Olive L. French, thirty-seven additions to two hundred and ninety-six	2 50
Marion L. French, seventy-six additions to sixty-six	2 00
Roscoe G. Knight, one hundred and three additions to one hundred and twenty	2 00
Edward L. Morss, seventy-five additions to fifty	2 00
Robert D. Morss, twenty-five additions to one hundred and fifty	1 25

Philip B. Morss, twenty-five additions to one hundred and twenty-five	1 00
Winthrop C. Swain, twenty-five additions to sixty	75
GRASSES.—For fifty specimens:	
First prize, Olive L. French	5 00
For ten specimens:	
First prize, Joseph Murdoch	1 00
Second, Richard Murdoch	75
Gratuity:—	
John Murdoch, Jr., eighteen additions to thirty	2 00
SEDGES.—For thirty specimens:	
First prize, Joseph Murdoch	3 00
For twenty specimens:	
First prize, Richard Murdoch	2 00
Gratuities:—	
John Murdoch, Jr., twenty-three additions to forty-five	3 00
Olive L. French, seven additions to forty	1 00
FERNS.—For thirty specimens:	
First prize, Dorothea Clapp	5 00
For fifteen specimens:	
Second prize, Robert D. Morss	2 50
For ten specimens:	
Second prize, Philip B. Morss	1 50
Gratuities:—	
Roscoe G. Knight, seven additions to fifteen	1 25
John Murdoch, Jr., five additions to fifteen	1 00
SPRAYS OF LEAVES OF NATIVE TREES AND SHRUBS.—Collection, not less than thirty sheets, so arranged as to show both surfaces:	
First prize, Christine Dudley Clapp	3 00
Second, Roscoe G. Knight	2 00
Third, John Murdoch, Jr.	1 00
Gratuity:—	
Winthrop C. Swain, twenty sheets	75
Total for Gardens and Herbariums	$83 25

The amount of money appropriated by the Society for the use of the Committee was:

For Prizes and Gratuities	$125 00		
For Current Expenses	75 00		
		$200 00	
Received from sales of paper		4 25	
			$204 25
Awarded for School Gardens		$20 00	
Awarded for Herbariums		63 25	
Paper		18 04	
Advertising		19 60	
Expressage, posters, stamping, etc.		13 00	
Postage, wrappers, etc.		1 50	
Total Expense			135 39
Balance unexpended			$68 86

HENRY L. CLAPP, *Chairman*, Roxbury,
MISS KATHARINE W. HUSTON, Roxbury,
WILLIAM P. RICH, Chelsea,
CHARLES W. JENKS, Bedford,
MRS. H. L. T. WOLCOTT, Dedham,
HENRY S. ADAMS, Boston,
W. E. C. RICH, *Secretary*,
99 Moreland Street, Roxbury, Mass.

Committee on School Gardens and Children's Herbariums.

REPORT

OF THE

COMMITTEE ON NATIVE PLANTS

FOR THE YEAR 1901.

By Charles W. Jenks.

At the meeting of the Society May 4th last, it was voted "that Charles W. Jenks be appointed to award the prizes offered for Native Plants with liberty to call in the aid of such experts as he may think proper." As there have been no general exhibitions this year, there has been no work for your committee to do.

It seems to me, if the Society wishes to continue these exhibitions, which in past years have been so attractive to many visitors, a committee of three or five members should be chosen, as it is difficult for any one member to be present every Saturday, especially during the vacation season.

While I must decline to serve longer as the only member, I would be pleased to serve as one of three or five, should the Society so desire.

REPORT

OF THE

Committee on Forestry and Roadside Improvement

FOR THE YEAR 1901.

By HARVEY N. SHEPARD, CHAIRMAN.

To the President and Members of the Massachusetts Horticultural Society:—

The Committee on Forestry and Roadside Improvement respectfully report:

The work referred to in our previous reports of keeping in touch with the tree wardens and others in the Commonwealth for the purpose of furthering the welfare of our roadside trees has been kept up more actively than ever, both in the collection of supplementary material and in the supplying of information and advice. The interest grows and the service rendered becomes more important. The classifying of the material also has gone forward steadily and as rapidly as possible, but cannot, we greatly regret, be completed in season for this report. In our judgment, the work should be kept up, and next year should see a valuable report upon it.

We have distributed this year about eight hundred copies of the Circulars from the Boston Society of Natural History relative to the Protection of Native Plants in connection with our own Circular, and about four hundred copies of the Circular of the American Park and Outdoor Art Association.

In co-operation with like committees from the Appalachian Mountain Club and the Massachusetts Forestry Association we

met the Commissioners of the Greylock Reservation, made a careful examination of its condition, and have submitted previously to the three associations our unanimous opinions relative thereto.

The work begun upon another branch of our duties, in an endeavor to ascertain the economic value of wood planting in the Commonwealth, continues, and we trust to be able next year to make a report relative thereto.

The pamphlet containing the laws of the Commonwealth relative to forests and trees has been widely distributed, and the many communications sent to us show that it was greatly needed and has been of much value.

HARVEY N. SHEPARD,
NATHANIEL S. SHALER,
J. WOODWARD MANNING,
JAMES STURGIS PRAY,
HENRY S. HUNNEWELL,
Committee on Forestry and Roadside Improvement.

REPORT

OF THE

COMMITTEE OF ARRANGEMENTS

FOR THE YEAR 1901.

By JOSEPH H. WOODFORD, CHAIRMAN.

The past year has been one of unusual experience as far as our exhibitions have been concerned. Owing to the sale of our old Hall on Tremont Street, and our having to vacate the premises on the first day of May last, we were unable, after that date, to hold any exhibitions until we could occupy our new Hall in November. Consequently, the duties of your Committee have been much lighter than they would have been had the new Hall been completed earlier in the season.

It may not be polite or courteous to the Building Committee to criticise their work or the unfinished condition of the interior of the new building, but we cannot pass over the fact that not one member of the working committees of our Society was consulted as to the size of the halls, the convenience of access, the adaptability for exhibitions, or the accommodation of an audience visiting the exhibitions.

In our report for the year 1895 we pointed out the inadequacy of our then accommodations, and at that time intimated that we should "have a hall of easy access and of sufficient capacity to accommodate any and all of our exhibitions, and at the same time capacious enough to contain a large audience comfortably."

You see what we have got. The main hall in this building is not as large as the two halls in the old. There is no space convenient in the new building for the storage of tables, etc., when

out of use. The lights are too far away from the plants and flowers, and there is no accommodation for an audience.

To ameliorate these conditions, in part, we would recommend the digging out of the earth which was filled in, in the main hall, and covering the ground with a concrete floor; then extend a floor on the same level of the loggia over the whole space, thus bringing the exhibitions nearer the light, and, at the same time, affording sufficient storage accommodations for all furniture, etc., used in our exhibitions. Furthermore, we would recommend that three galleries be constructed, one on each side near the loggia, and one at the rear end of the hall, to accommodate the public, and when all this is done, to tint the walls some color which will not absorb light and destroy the color of flowers.

If these suggestions are carried out the alterations will in a great measure help the exhibitions and contribute to the comfort of an appreciative public.

The amount of money placed at the disposal of this Committee has only in part been expended, but that part judiciously and for the best interests of the Society. The receipts for admission to the two paying exhibitions, Spring and Chrysanthemum, show an increase over those of last year, which is extremely gratifying.

The Treasurer shows by his books receipts for the

Spring Exhibition	$375 75
Chrysanthemum Exhibition	1,943 25
Making a total of	$2,319 00

which is in the Treasury of the Society.

Respectfully submitted,

JOSEPH H. WOODFORD,
ARTHUR H. FEWKES,
J. WOODWARD MANNING,
E. W. WOOD,
WARREN HOWARD HEUSTIS,
PATRICK NORTON,
ROBERT FARQUHAR,

Committee of Arrangements.

REPORT

TO THE

STATE BOARD OF AGRICULTURE

FOR THE YEAR 1901.

This year has been a very important one in the history of the Massachusetts Horticultural Society, as it marks the removal from their old building to their new building, corner of Massachusetts and Huntington Avenues.

On the first of May, 1901, the old hall was transferred to a syndicate and the work of tearing down was begun.

The old Horticultural Hall was dedicated in 1865.

The Society, with the exception of the Pennsylvania Horticultural Society, the first of its kind in this country, was organized March 17, 1829, fully incorporated in June of the same year with one hundred and forty members. The first exhibition of any size was the "Spring Exhibition," held March 19th, at which many flowers and plants were shown.

The new building was opened to the public June 4th, 1901 with the most notable and beautiful display of flowers ever seen in Boston. It was pronounced by experts to be the finest show ever given in the country. It was truly a floral triumph, there being a remarkable display of orchids, azaleas and other plants. Credit for the arrangement of the exhibition is due to Prof. C. S. Sargent, assisted by Miss Beatrix Jones.

A departure was made at this exhibition by having the building open on Sunday; thousands took advantage of the opportunity thus offered.

Weekly summer exhibits of fruits and flowers were omitted this year.

September 21st a meeting was held, and the building formally accepted by the Society.

In November the first real exhibition of the Society for prizes was held in the new building, the show in June being an opening exhibition of the building and not for premiums. This show, with the combination of Annual Chrysanthemum, Fruit, Plant, Flower and Vegetable Shows, offered opportunity for exhibitors from every department of horticulture, with a premium list of $3,000.

It was a very beautiful display, but I would suggest that the arrangement of flowers be left to one person, not to each exhibitor. In this manner combinations of color would be made more pleasing to the eye.

Respectfully submitted,

N. I. Bowditch,

Inspector.

REPORT

OF THE

Committee on Lectures and Publication

FOR THE YEAR 1901.

The Committee on Lectures and Publication submit the following report: We have had the following lectures delivered the past year, commencing January 12 and closing the course March 30:

January 12. Hardy Evergreen Trees and Shrubs and their Uses. By J. Woodward Manning, Reading.

January 19. The Trees of our Neighborhood. By Miss Emma G. Cummings, Brookline.

January 26. A Visit to Kew Gardens and Hampton Court. By Benjamin P. Ware, Marblehead.

February 9. Growing and Exhibiting Vegetables and Fruits. By Herbert R. Kinney, Worcester.

February 16. The Advancement of Market Gardening in the past Twenty-five Years. By Michael Sullivan, Revere.

February 23. A Quarter-Century's Evolution in American Horticulture. By Patrick O'Mara, New York, N. Y.

March 9. Fruit Culture in New England and its Development the Last Fifty Years. By Hon. Aaron Low, Hingham.

March 16. Parasitic Fungi. By Professor George F. Atkinson, Cornell University, Ithaca, N. Y. This lecture was delivered on the John Lewis Russell foundation.

March 23. Twenty Years of Peach Growing in Massachusetts. By John W. Clark, North Hadley.

March 30. Insects Injurious to Fruits and Vegetables. By Professor H. T. Fernald, Amherst.

As in former years, abstracts made from advance copies of the lectures have been printed in the *Evening Transcript* of the day when the lecture was delivered, and extra copies of these abstracts have been placed on the table on the next Saturday, and have been freely distributed and eagerly sought after. It is believed that no course of lectures has been listened to more attentively, or by larger audiences.

The Schedule of Prizes was, as hoped and anticipated, ready at the beginning of the year or a few days before, but the work on the TRANSACTIONS has been greatly hindered by the two removals of the Library and other property of the Society, which unavoidably consumed much of the time of the Secretary and Librarian and his assistants. And even now that we are comparatively settled, our distance from the business portion of the city is found a serious obstacle to the speedy printing of the Society's publications. Part II of 1900 has been printed and distributed during the year, and Part I for 1901 is nearly all in type.

Respectfully submitted,

AARON LOW,
JAMES H. BOWDITCH,
E. W. WOOD,
Committee.

REPORT

OF THE

COMMITTEE ON THE LIBRARY

FOR THE YEAR 1901.

By WM. E. ENDICOTT, CHAIRMAN.

The number of books purchased this year has been much smaller than in many other years for the obvious reason that from April to October the library had no permanent quarters. A larger part of our appropriation than usual has been devoted to binding, very much of which has been done.

Our books have been moved twice during the year; in April from our old hall to the Tremont Building, and six months later to the present library room. These transfers were admirably planned and carried out, we believe, as well as could be done, but it was not possible to prevent damage entirely.

Of the present library room it is not necessary to say much, it speaks for itself; the Library Committee has had absolutely nothing to do with planning or furnishing it. It seems to us that much harm will come to the books unless glass doors be fitted to the cases, and it is obvious that the shelves, all of which are eight inches deep, are not adapted to take books fourteen inches wide; but these things, we hope, may soon be remedied.

At a recent meeting, the Society voted that any further furnishing of the library room should be entrusted to the Library Committee, and we shall give our earnest attention and endeavors to make good such defects as may be found to exist.

WM. E. ENDICOTT,
GEORGE W. HUMPHREY,
WALTER S. PARKER,
GEORGE E. DAVENPORT,
CHARLES W. SWAN,
Library Committee.

The New Library.

REPORT

OF THE

SECRETARY AND LIBRARIAN

FOR THE YEAR 1901.

For many years the difficulty of avoiding in these reports from year to year an appearance of sameness has been remarked on, but this year the completion of the Society's new building and the removal to it of the library and all other departments of the Society's work, has made a break in that sameness which has not occurred before for thirty-five years, and is not likely to occur again for many more. Owing to the failure of the contractor to complete the new building by the time when our lease of the old one expired, it seemed expedient to hire temporary rooms for the deposit of the library, and a convenient suite of rooms in the Tremont Building, comprising, besides quiet and pleasant rooms for the accommodation of the library, a room for the meetings of the Society and Committees, were procured, these rooms being all fireproof. To them the books and bookcases were conveyed, and the former placed in the latter, so that they could be as well consulted as in the old room. Though this course involved two removals, instead of the one which we had hoped would be sufficient, it was undoubtedly better for the welfare of the books as well as for their usefulness, than if they had been stored in bulk in a storage warehouse. I regret, however, that it was not better understood among the members of the Society, that the books were as accessible for home use or consultation by them as they ever had been.

Both removals and rearrangements were affected in a skilful and expeditious manner under the immediate direction of Miss C. M. Endicott, who deserves much credit therefor. So far as is now known this was done without the loss of a single book, and so

careful were the teamster and his assistants employed to convey them from place to place, that not one of the two hundred panes of glass (mostly large ones) in the bookcases was broken.

The want of increased accommodations as a serious obstacle to ready reference to many books was first brought to the attention of the Society by the Library Committee in their report in 1875. The bookcases added since have afforded a relief, which though indispensable, has never been sufficient to afford proper accommodation to the books, and it is a great satisfaction to feel that after the lapse of twenty-five years we have shelf room of such extent as not only to show the back of every book but to afford room for the additions of future years. But it is a great drawback to this satisfaction to be obliged to say that the shelves, with which the library was fitted by the Building Committee, were found so narrow that more than two thousand volumes are too large to be supported by them.

Not so many books have been purchased as in some previous years, but among those worthy of special mention are Rouy's Illustrationes Plantarum Europæ Rariorum, thus far comprising fifteen fascicles, with three hundred and seventy-five plates; thirteen volumes of Morot's Journal de Botanique; Saccardo's La Botanica in Italia; Theophrastus, de Historia Plantarum (the best edition); Torrey, Eddy and Knevels's Catalogue of Plants within thirty miles of the City of New York, Albany, 1819; Clute's Our Ferns in their Haunts; Gardens, Old and New; Miss Jekyll's Wall and Water Gardens; Mrs. Earle's Old Time Gardens; the Pomologie de la France, in eight volumes, with beautifully colored plates; Bailey's Principles of Vegetable Gardening; and Marshall's Mushroom Book. Fascicles 123-125 of Martius's Flora Brasiliensis; Vol. 3 of Bailey's Cyclopedia of American Horticulture; and the continuation of may other serial works have been received.

When the work of removal was begun, it was necessary to pursue it as far as possible to the exclusion of all other work, and consequently as much progress has not been made on the publications of the Society as I could have wished. The Schedule of Prizes of 1901 was as usual ready on the first of January, and we trust that that for 1902 will be equally prompt, but it must be understood that the distance of our location from any printing

office is a serious obstacle to prompt despatch of such work. Part II of our Transactions for 1900 was issued early in the year, and Part I for 1901 is nearly all in type.

If I may return to the subject of the library, I would close this Report with the words with which Mr. Parkman, then Chairman of the Library Committee, closed his first report after the occupation of the Tremont Street Hall — "Our library may be said to bear to this noble building the relation which the brain bears to the body, and the Society is aware of the importance to its interests of replenishing and invigorating this vital part."

ROBERT MANNING,
Secretary and Librarian.

CORRECTION.

In Part I, 1901, of the Transactions, the names of two of the plates — *Tsuga Sieboldii* and *Thuya occidentalis* var. *aurea* — should be transposed.

TREASURER'S REPORT.

FOR THE YEAR 1901.

MASSACHUSETTS HORTICULTURAL SOCIETY, *in account current with* CHARLES E. RICHARDSON, *December 31st, 1901.*

DR.

To amount paid on New Building					$197,913 28
" " " for Furniture and Exhibition Ware					449 65
" " " on account of Library			$416 66		
" " " from income of John S. Farlow fund			161 95		
" " " from income of J. D. Williams French fund			182 30		
					760 91
" " " Interest on funds for Prizes, credited opposite					2,026 06
" " " for Heating			$1,008 15		
" " " " Lighting			319 69		
" " " " Water rates			109 23		
" " " " Labor			2,098 50		
" " " " Stationery, Printing and Postage			1,905 36		
" " " " Incidentals			1,532 89		
" " " " Repairs			43 98		
" " " " " to Furniture, etc.			302 00		
" " " " Committee of Arrangements			175 30		
" " " " " on School Gardens and Children's Herbariums			50 64		
" " " " Lectures and Publications			255 00		
" " " " Committee on Forestry and Roadside Improvement			147 64		
" " " " Salaries of Treasurer, Secretary and Assistants			4,300 00		
" " " " Salaries of Committees			897 00		
" " " " Tax on So. Boston Property			140 06		
Amounts carried forward				$13,285 44	$201,149 90

Amounts brought forward	$13,285 44	$201,149 90
To amount paid for Abating nuisance on So. Boston Property . .	55 48	
" " " " Electric Power . . .	37 53	
" " " " Rent of Building, 101 Tremont Street . . .	10,000 00	
" " " " Rent of Rooms in Tremont Building and Chickering Hall	1,858 31	
" " " " Legal Services . . .	58 70	
" " " " Storage	202 50	
		25,497 96
" " " " Prizes awarded in 1900, paid in 1901, viz.:		
H. H. Hunnewell Prizes for Rhododendrons	105 00	
Prizes for Plants	1,839 88	
" " Flowers	2,237 32	
" " Fruit	1,586 00	
" " Vegetables	1,181 50	
" " Gardens and Greenhouses .	451 80	
" " Native Plants	160 20	
" " School Gardens and Children's Herbariums	100 00	
		$7,661 70
		$234,309 56
Balance of Cash December 31st, 1901 . . .		26,481 72
		$260,791 28

CR.

By Balance of account rendered December 31st, 1900 . .			$74,864 73
" Building in 1901: —			
Rent of Halls . . .	$1,230 34		
" " Stores . . .	2,255 50		
		$3,485 84	
" Annual Exhibitions, Gross . .	2,319 00		
Less Expenses . . .	946 11		
		1,372 89	
" Admissions and Assessments . . .		1,246 00	
" Mt. Auburn Cemetery		4,641 00	
" State Bounty		600 00	
Amounts carried forward . . .		$11,345 73	$74,864 73

Amounts brought forward		$11,345 73	$74,864 73
By Interest on Bonds	$10,195 00		
" " " Loan	3,231 53		
" " " Bank Balances	720 80		
		14,147 33	
" Insurance		113 66	
" J. D. Williams French		5,000 00	
" Francis Brown Hayes Bequest		23,293 77	
" Loan on Call		130,000 00	
" Interest credited following Funds charged opposite:			
Samuel Appleton Fund	$50 00		
John A. Lowell "	50 00		
Theodore Lyman "	550 00		
Josiah Bradlee "	50 00		
Benjamin V. French "	25 00		
W. J. Walker "	117 72		
Levi Whitcomb "	25 00		
Benjamin B. Davis "	25 00		
Marshall P. Wilder "	50 00		
John Lewis Russell "	50 00		
H. H. Hunnewell "	200 00		
Francis Brown Hayes "	500 00		
Henry A. Gane "	50 00		
John S. Farlow "	100 00		
J. D. Williams French "	183 34		
		2,026 06	
			185,926 55
			$260,791 28

CHARLES E. RICHARDSON,
Treasurer.

Approved:

WALTER HUNNEWELL, } *Finance*
O. B. HADWEN, } *Committee.*

AUDITOR'S CERTIFICATE.

28 State Street, Boston, February 18th, 1902.

MESSRS. WALTER HUNNEWELL,
ARTHUR F. ESTABROOK,
O. B. HADWEN,

Finance Committee of the
Massachusetts Horticultural Society.

Gentlemen:—In compliance with your request, I made a thorough audit of the books and general accounting affairs of the Massachusetts Horticultural Society for the year which ended with the 31st day of December, 1901, and herewith submit to you my report of the same.

Report.

I added the ledger, journal and cash book and the small books tributary to the cash book and saw that all balances were correctly carried forward. I examined and checked the vouchers representing the disbursements during the year and found the amount of cash required by the cash book upon the first day of January, 1902, to have been on hand, and also examined the securities of the Society in the custody of the Treasurer and found that they were in all instances in accordance with the requirements of the record. I traced all postings from the journal and cash book into the ledger and proved the correctness of the balance sheet taken from the ledger as of the 31st day of December, 1901, which is a true statement of the financial condition of the Society upon said date, to the best of my knowledge and belief.

In short, I satisfied myself that the work in connection with the accounting affairs of the Society was being conscientiously and honestly performed, and that there was every evidence of faithfulness upon the part of the Treasurer.

Yours very respectfully,

ANDREW STEWART,
Examiner of Accounts.

ASSETS AND LIABILITIES OF THE MASSACHUSETTS HORTICULTURAL SOCIETY.

DECEMBER 31, 1901.

ASSETS.

Real Estate	$515,997 36	
Furniture and Exhibition Ware	8,157 15	
Library	40,573 38	
Stereotype plates and copies of History	246 50	
Sinking Fund	23,872 50	
Chicago, Burlington & Quincy R. R. Bonds	1,000 00	
Kansas City, Clinton & Springfield " "	1,980 00	
Lake Shore & Michigan Southern " "	10,415 25	
Atchison, Topeka & Santa Fé " "	44,693 25	
Chicago, Burlington & Quincy, "Nebraska Extension" R. R. Bonds	50,012 50	
Chicago & West Michigan R. R. Bonds	9,987 50	
Kansas, Fort Scott & Memphis R. R. Bonds	27,523 75	
Chicago, Burlington & Quincy, Illinois Division R. R. Bonds	51,625 00	
City of Newton Bonds	24,228 75	
W. A. Hayes and A. P. Loring, Trustees	3,488 76	
Cash	26,481 72	
		$840,283 37

LIABILITIES.

Prize Funds invested in Bonds:			
Samuel Appleton Fund,	$1,000 00		
John A. Lowell "	1,000 00		
Theodore Lyman "	11,000 00		
Josiah Bradlee "	1,000 00		
Benjamin V. French "	500 00		
H. H. Hunnewell "	4,000 00		
W. J. Walker "	2,354 43		
Levi Whitcomb "	500 00		
Benjamin B. Davis "	500 00		
Marshall P. Wilder "	1,000 00		
J. Lewis Russell "	1,000 00		
Francis Brown Hayes "	10,000 00		
Henry A. Gane "	1,000 00		
John S. Farlow "	2,500 00		
J. D. Williams French "	5,000 00		
		$42,354 43	
Prizes for 1901 payable in 1902		8,200 00	
			$50,554 43
Surplus			789,728 94
			$840,283 37

CHARLES E. RICHARDSON,
Treasurer.

Membership Account of the Massachusetts Horticultural Society, December 31st, 1901.

Life Membership per last report	682		
Added in 1901	23		
Commuted from Annual	7		
		712	
Deceased		26	
			686
Annual Membership per last report	199		
Added in 1901	7		
		206	
Commuted to Life	7		
Deceased	5		
Resigned	3		
Dropped for non-payment for two years	7		
		22	
			184
Present Membership			870

INCOME FROM MEMBERSHIP.

23 new Life Members @ $30	$690 00
7 Commuted to Life @ $20	140 00
7 new Annual Members @ $10	70 00
Assessments	346 00
	$1,246 00

CHARLES E. RICHARDSON,
Treasurer.

Dr. *Massachusetts Horticultural Society in account with the Proprietors of the Cemetery of Mount Auburn.* **Cr.**

For Sales and Improvements within the Cemetery for the year ending December 31st, 1901.

To cost of filling up and improving land at Mount Auburn for the year ending December 31st, 1901. The Massachusetts Horticultural Society being charged with their proportion of same:					
Rear of Walnut Avenue and Fern Path	$380	78			
Magnolia Avenue	3	15			
Between Cherry and Birch Avenues	150	38			
Glen Avenue	22	88			
	$557	19			
One-fourth part of $557.19	$139	80			
Balance due Mass. Horticultural Society,	4,641	00			
			$4,780	80	

By Sales in January	$1,115	00
" " " February	600	00
" " " March	40	00
" " " April	1,462	50
" " " May	4,689	50
" " " June	3,423	20
" " " July	782	00
" " " August	1,151	00
" " " September	1,610	00
" " " October	2,995	00
" " " November	1,480	00
" " " December	70	00
	$19,368	20
Net amount received from Receiving Tomb	1,193	00
	$20,561	20
Less graves repurchased	40	00
	$20,521	20
Deduct for Annual Expense	1,400	00
	$19,121	20
One-fourth of $19,121.20	$4,780	80

E. & O. E.

JOHN L. DILL, *Treasurer.*

BOSTON, December 31, 1901.

THE MASSACHUSETTS HORTICULTURAL SOCIETY

To the PROPRIETORS OF THE CEMETERY OF MOUNT AUBURN. *Dr.*

To cost of filling up and improving land at Mount Auburn for the year ending Dec. 31st, 1901. The Massachusetts Horticultural Society being charged with their proportionate part.

Rear of Walnut Avenue and Fern Path.

130.4 days, man	$293 40	
23.3 days, man and horse	87 38	
		$380 78

Magnolia Avenue.

1.4 days, man	$3 15	3 15

Between Cherry and Birch Avenues.

40.1 days, man and horse	150 38	150 38

Glen Avenue.

6.1 days, man and horse	22 88	22 88
		$557 19
One-fourth of $557.19		$139 30

JAMES C. SCORGIE,
Supt. of the Cemetery of Mount Auburn.

MOUNT AUBURN, December 31, 1901.

I certify the above to be a true copy of improvements for the year 1901 as rendered by the Superintendent.

JOHN L. DILL,
Treasurer.

Massachusetts Horticultural Society.

OFFICERS AND STANDING COMMITTEES FOR 1902.

President.

O. B. HADWEN, of Worcester.

Vice-Presidents.

BENJAMIN P. WARE, of Clifton.

SAMUEL HOAR, of Concord.

JOSEPH R. LEESON, of Newton Centre.

OAKES AMES, of North Easton.

Treasurer and Superintendent of the Building.

CHARLES E. RICHARDSON, of Brookline.

Secretary and Librarian.

ROBERT MANNING, of Salem.*

Professor of Botany and Vegetable Physiology.

BENJAMIN M. WATSON, of Jamaica Plain.

Professor of Entomology.

SAMUEL H. SCUDDER, of Cambridge.

Delegate to the State Board of Agriculture.

WILLIAM H. SPOONER, of Jamaica Plain.

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* Communications to the Secretary, on the business of the Society, should be addressed to him at Horticultural Hall, Boston.

STANDING COMMITTEES.

Executive.

THE PRESIDENT, O. B. HADWEN, CHAIRMAN.

THE CHAIRMAN OF THE FINANCE COMMITTEE, WALTER HUNNEWELL, *Ex officio*.

WILLIAM C. STRONG.
WILLIAM H. SPOONER.
NATHANIEL T. KIDDER.
FRANCIS H. APPLETON.
BENJAMIN C. CLARK.
CHARLES W. PARKER.
CHARLES F. CURTIS.

Finance.

WALTER HUNNEWELL, OF BOSTON, CHAIRMAN.

O. B. HADWEN.
ARTHUR F. ESTABROOK.

Lectures and Publication.

AARON LOW, OF HINGHAM, CHAIRMAN.

JAMES H. BOWDITCH.
E. W. WOOD.

Library.

WILLIAM E. ENDICOTT, OF CANTON, CHAIRMAN.

GEORGE W. HUMPHREY.
WALTER S. PARKER.
GEORGE E. DAVENPORT.
CHARLES W. SWAN.

Plants.

ARTHUR H. FEWKES, OF NEWTON HIGHLANDS, CHAIRMAN.

JAMES WHEELER.
WILLIAM J. MARTIN.
ROBERT CAMERON.
ROBERT MELROSE GREY.

Flowers.

J. WOODWARD MANNING, OF READING, CHAIRMAN.

MICHAEL H. NORTON.
KENNETH FINLAYSON.
FREDERICK S. DAVIS.
JAMES COMLEY.

Fruits.

E. W. WOOD, OF WEST NEWTON, CHAIRMAN.

CHARLES F. CURTIS.
WARREN FENNO.
J. WILLARD HILL.
GEORGE F. PIERCE.
JOHN L. BIRD.
FREDERICK W. DAMON.

Vegetables.

WARREN H. HEUSTIS, OF BELMONT, CHAIRMAN.

VARNUM FROST.
WALTER RUSSELL.
AARON LOW.
GEORGE D. MOORE.
JOSHUA C. STONE.
MICHAEL SULLIVAN.

Forestry and Roadside Improvement.

HARVEY N. SHEPARD, CHAIRMAN.

NATHANIEL S. SHALER. HENRY S. HUNNEWELL.
J. WOODWARD MANNING. JAMES STURGIS PRAY, SECRETARY.

Gardens.

PATRICK NORTON, OF DORCHESTER, CHAIRMAN.

CHAIRMEN OF THE COMMITTEES ON PLANTS, FLOWERS, FRUITS, VEGETABLES, AND ARRANGEMENTS, *Ex officiis*.

HENRY W. WILSON. JACKSON T. DAWSON.

For Establishing Prizes.

WILLIAM H. ELLIOTT, OF BRIGHTON, CHAIRMAN.

CHAIRMEN OF THE COMMITTEES ON PLANTS, FLOWERS, FRUITS, VEGETABLES, AND GARDENS, *Ex officiis*.

WILLIAM J. MARTIN.

Committee of Arrangements.

JOSEPH H. WOODFORD, OF BOSTON, CHAIRMAN.

CHAIRMEN OF THE COMMITTEES ON PLANTS, FLOWERS, FRUITS, VEGETABLES, AND GARDENS, *Ex officiis*.

ROBERT FARQUHAR.

MEMBERS FOR LIFE.

Members of the Society and all other persons who may know of deaths, changes in residence, or other circumstances showing that the following list is incorrect in any particular, will confer a favor by promptly communicating to the Secretary any needed corrections.

Information, or any clew to it, is especially desired in regard to members whose names are marked thus,†

Adams, Mrs. Charles Francis, South Lincoln.
Adams, Henry Saxton, Boston.
Alger, Rev. R. F., Dorchester.
Allen, Hon. Charles H., Lowell.
Allen, Thomas, Boston.
Ames, F. Lothrop, North Easton.
Ames, Mrs. F. L., North Easton.
Ames, George, Boston.
Ames, John S., North Easton.
Ames, Miss Mary S., North Easton.
Ames, Oakes, North Easton.
Ames, Oliver, North Easton.
Ames, Mrs. Oliver, Sr., North Easton.
Ames, Preston Adams, Boston.
Ames, Miss Susan E., North Easton.
Amory, C. W., Boston.
Amory, Frederick, Boston.
Anderson, Larz, Brookline.
Andrews, Charles L., Milton.
Andrews, Frank W., Washington, D. C.
Andros, Milton, San Francisco, Cal.
Appleton, Francis H., Boston.
Appleton, William S., Boston.
Arnold, Mrs. George Francis, Brookline.
Ash, John, Pomfret Centre, Conn.
Asmus, Ernst G., West Hoboken, N. J.
Atkins, Edwin F., Belmont.
Ayer, James B., Boston.

Bailey, Jason S., West Roxbury.
Baker, James E., South Lincoln.
Ball, George H., Boston.
Banfield, Francis L., M.D., Worcester.
Barber, J. Wesley, Newton.
Barnard, James M., Boston.
Barnard, Robert M., Everett.
Barnes, Walter S., Somerville.
† Barney, Levi C., Boston.
Barry, John Marshall, Boston.
Barry, William C., Rochester, N. Y.
Bartlett, Edmund, Newburyport.
Bartlett, Francis, Beverly.
Bartlett, Miss Mary F., Boston.
Bates, Miss Mary D., Ipswich.
Baylies, Walter C., Taunton.
Beal, Leander, Swampscott.
Becker, Frederick C., Cambridge.
Beckford, Daniel R., Jr., Dedham.
Beebe, E. Pierson, Boston.
Beebe, Franklin H., Boston.
Beebe, J. Arthur, Boston.
Bigelow, Albert S., Cohasset.
Bigelow, Joseph S., Cohasset.
Bigelow, Dr. William Sturgis, Boston.
Black, George N., Manchester.

Blake, Miss Anne, Brookline.
Blake, Mrs. Arthur W , Brookline.
Blake, Edward D., Boston.
Blake, Francis, Weston.
Blake, Frederick A., Rochdale.
Blakemore, John E., Roslindale.
Blanchard, John W., West Newton.
Blinn, Richard D., Chicago, Ill.
Bliss, William, Boston.
Boardman, Samuel M., Hyde Park.
Boardman, T. Dennie, Manchester.
Bôcher, Prof. Ferdinand, Cambridge.
Bockus, Charles E., Dorchester.
Bosler, Frank C., Carlisle, Penn.
Bowditch, Charles P., Jamaica Plain.
Bowditch, Ernest W., Milton.
Bowditch, James H., Brookline.
Bowditch, Nathaniel I., Framingham.
Bowditch, William E., Roxbury.
Bowker, William H., Boston.
Brackett, Cephas H., Newton.
Breck, Joseph Francis, Allston.
Bremer, Mrs. John L., Manchester.
Bresee, Albert, Hubbardton, Vt.
Brewer, Francis W., Hingham.
Briggs, William S., Lincoln.
Brigham, William T., Honolulu, Hawaii.
Brooks, Henry, Lincoln.
Brooks, J. Henry, Milton.
Brooks, Lawrence, Groton.
Brooks, Peter C., Boston.
Brooks, Shepherd, Boston.
Brown, Alfred S., Jamaica Plain.
Brown, Edward J., Weston.
Brown, George Barnard, Brookline.
Brown, John M., Belmont.
Brown, Samuel N., Boston.
Burlen, William H., Boston.
Burnett, Harry, Southborough.
Burnham, John A , Manchester.
Burnham, Lamont G., Essex.
Burr, Matthew H., Hingham.
Buswell, Frank E., Brooklyn, N Y.
Butler, Aaron, Wakefield.
Butler, Edward K., Jamaica Plain.
Cabot, Dr. Arthur T., Boston.
†Cadness, John, Flushing, N. Y.
Cains, William, South Boston.
Calder, Augustus P., Boston.
Cameron, Robert, Cambridge.
Campbell, Francis, Cambridge.
Capen, John, Boston.
Carlton, Samuel A., Boston.
Carr, Hon. John, Roxbury.
Carter, Charles N., Boston.
Carter, Miss Maria E., Woburn.
Cartwright, George, Dedham.
Casas, W. B. de las, Malden.
Chadbourne, Marshall W., East Watertown.
Chaffin, John C., Newton.
Chamberlain, Chauncy W., Brookline.
†Chase, Andrew J., Lynn.
Chase, Daniel E., Somerville.
Chase, George B., Dedham.
Chase, William M., Dorchester.
Cheney, Amos P , Natick.
Cheney, Mrs. Elizabeth S., Wellesley.
Childs, Nathaniel R., Boston.
Choate, Charles F., Southborough.
Christie, William, Chelsea.
Claflin, Hon. William, Newtonville.
Clapp, Edward B., Dorchester.
Clapp, James H., Dorchester.
Clapp, William C., Dorchester.
Clark, Benjamin C., Boston.
Clark, B. Preston, Cohasset.
Clark, Miss Eleanor J., Pomfret Centre, Conn.
Clark, J. Warren, Rockville.
Clarke, Miss Cora H., Boston.
Clarke, Eliot C., Boston.
Cleary, Lawrence, Roxbury.
Clough, Micajah Pratt, Lynn.
Cobb, John C., Milton.
Coburn, Isaac E., Everett.
Codman, James M., Brookline.
Codman, Ogden, South Lincoln.
Coe, Miss Mary Alma, Boston.

Coffin, Abraham B., Winchester.
Cole, Edward E., Boston.
Collamore, Miss Helen, Boston.
Colton, Samuel H., Worcester.
Converse, Elisha S., Malden.
Converse, Col. H. E., Malden.
Coolidge, Joshua, Mount Auburn.
Coolidge, J. Randolph, Chestnut Hill.
Coolidge, Mrs. J. Randolph, Chestnut Hill.
Coolidge, T. Jefferson, Jr., Boston.
Cottle, Henry C., Boston.
Cox, Thomas A., Dorchester.
Coy, Samuel I., Boston.
Craig, William Nicol, North Easton.
Crane, Zenas, Dalton.
Crawford, Dr. Sarah M., Roxbury.
Crocker, Hon. George G., Boston.
Crocker, Miss S. H., Boston.
Crosby, George E., West Medford.
Cross, Alfred Richard, Nantasket.
Crowell, Randall H., Watertown.
Curtis, Charles F., Jamaica Plain.
Curtis, Charles P., Swampscott.
Curtis, Charles P, Jr., Boston.
Cushing, Livingston, Weston.
Cushing, Robert M., Boston.
Cutting, Gen. Walter, Pittsfield.

† Daggett, Henry C., Boston.
Dalton, Charles H., Beverly.
Daly, John C., Roxbury.
Damon, Frederick W., Arlington.
Dana, Charles B., Wellesley.
Daniels, Dr. Edwin A., Boston.
Davenport, Albert M., East Watertown.
Davenport, George E., Medford.
Davis, Edward L., Worcester.
Davis, John, Lowell.
Davis, L. Shannon, Brookline.
Dawson, Jackson T., Jamaica Plain.
Dee, Thomas W., Cambridge.
Denny, Clarence H., Boston.
Denton, Eben, Dorchester.
Dexter, F. Gordon, Boston.
Dexter, George, Beverly.
Dike, Charles C., Stoneham.
Doliber, Thomas, Brookline.
Donald, William, West Roxbury.
Donaldson, James, Roxbury.
Dorr, George, Dorchester.
Dove, George W. W., Andover.
Dowse, William B. H., West Newton.
Draper, Hon. Eben S., Hopedale.
Draper, George A., Hopedale.
Dreer, William F., Philadelphia, Pa.
Dumaresq, Herbert, Chestnut Hill.
Duncan, James L., Chelsea.
Dunlap, James H., Nashua, N. H.
Durant, William, Boston.
Durfee, George B., Fall River.
Dutcher, Frank J., Hopedale.
Dwight, Theodore F., Kendal Green.

Eaton, Horace, Cambridge.
Edgar, William W., Waverly.
Eldredge, H. Fisher, Boston.
† Eldridge, E. H., Roxbury.
Elliot, Mrs. John W., Boston.
Elliott, William H., Brighton.
Endicott, William, Boston.
Endicott, William, Jr., Boston.
Endicott, William C., Jr., Danvers.
Endicott, William E., Canton.
Estabrook, Arthur F, Boston.
Ewell, Warren, Dorchester.

Fairchild, Charles, Boston.
Falconer, William, Pittsburgh, Pa.
Farlow, Lewis H., Newton.
Farnsworth, Mrs. William, Dedham.
Farquhar, James F. M., Roslindale.
Farquhar, John K. M. L., Roxbury.
Farquhar, Robert, North Cambridge.
Faxon, John, Quincy.
Fay, H. H., Wood's Holl.
Fay, Joseph S., Jr., Wood's Holl.
Fenno, L. Carteret, Boston.
Fessenden, George B., Allston.
Fewkes, Arthur H., Newton Highlands.

Finlayson, Kenneth, Brookline.
Fisher, Peter, Ellis.
Flagg, Augustus, Boston.
Fletcher, George V., Belmont.
Fletcher, J. Henry, Belmont.
Fletcher, John W., Chelsea.
Flint, David B., Boston.
Foster, Charles H. W., Brookline.
Foster, Francis C., Cambridge.
Fottler, John, Jr., Dorchester.
Fowle, George W., Jamaica Plain.
Fowle, William B., Auburndale.
French, Miss Caroline L. W. Boston.
French, S. Waldo, Jamaica Plain.
French, W. Clifford, Cambridge.
Frohock, Roscoe R., Malden.
Frost, Irving B., Belmont.
Frost, Varnum, Arlington.

Galloupe, Charles W., Swampscott.
Galvin, John, Boston.
Gardner, Mrs. Augustus P., Hamilton,
Gardner, George A., Boston.
Gardner, George P., Boston.
Gardner, John L., Boston.
Gardner, Mrs. John L., Brookline.
Gardner, William Amory, Groton.
Gaston, William A., Boston.
Gibbs, Wolcott, M.D., Newport, R.I.
Gill, George B., Medford.
Gillard, William, Dorchester.
Gilmore, E. W., North Easton.
Gilson, F. Howard, Wellesley Hills.
Glover, Joseph B., Boston.
Goddard, Joseph, Sharon.
Goodell, L. W., Dwight.
Gorham, James L., Jamaica Plain.
† Gould, Samuel, Boston.
Gowing, Mrs. Clara E., Kendal Green.
Gray, James, Wellesley.
Gray, Mrs. John C., Boston.
Gregory, Hon. James J. H., Marblehead.
Grew, Edward S., Boston.
Grey, Benjamin, Malden.

Hadwen, Obadiah B., Worcester.
Hale, James O., Byfield.
Hall, Edwin A., Cambridgeport.
Hall, George A., Chelsea.
Hall, Jackson E., Boston.
Hall, Osborn B., Malden.
Hall, William F., Brookline.
Halliday, William H., South Boston.
Hammond, Gardiner G, New London, Conn.
Hammond, George W., Boston.
† Harding, George W., Arlington.
Harding, Louis B., Chestnut Hill.
Hardy, F. D., Cambridgeport.
Harlow, James F., Quincy.
Harris, Charles, Cambridge.
Harris, Thaddeus William, A.M., Keene, N. H.
Hartshorn, Arthur E., Worcester.
Harwood, George Fred, Newton.
Haskell, Edwin B., Auburndale.
Hastings, Levi W., Brookline.
Hatch, Mrs. C. S., North Cambridge.
Hatch, Edward, Boston.
Haven, Franklin, Boston.
Hawken, Mrs. Thomas, Rockland, Me.
Hayward, George P., Roxbury.
† Hazeltine, Hazen, Boston.
Hemenway, Augustus, Canton.
Hemenway, Mrs. Augustus, Canton.
Henshaw, Joseph P. B., Boston.
Henshaw, Samuel, Cambridge.
Heurlin, Julius, South Braintree.
Hewett, Miss Mary C., Canton.
Hews, Albert H., North Cambridge.
Higginson, Francis L., Boston.
Hilbourn, A. J., Boston.
Hill, John, Stoneham.
Hittinger, Jacob, Mt. Auburn.
Hoar, Samuel, Concord.
Hodgkins, John E., Portsmouth, N.H.

Hoitt, Hon. Charles W., Nashua, N. H.
Hollingsworth, Amor L., Milton.
Hollingsworth, Z. T., Boston.
Hollis, George W., Grantville.
Holmes, Edward J., Boston.
Holt, Gustavus C., Belmont.
Holt, Mrs. Stephen A., Cambridge.
Holt, William W., Winchester.
Hooper, William, Boston.
Horner, Mrs. Charlotte N.S., Georgetown.
Horsford, Miss Kate, Cambridge.
Hovey, Charles H., South Pasadena, Cal.
Hovey, Stillman S., Woburn.
Howard, Joseph W., Somerville.
Hubbard, Charles Wells, Weston.
Hubbard, James C., Everett.
Humphrey, George W., Dedham.
Hunnewell, Arthur, Wellesley.
Hunnewell, Henry Sargent, Wellesley.
Hunnewell, H. Hollis, Wellesley.
Hunnewell, Walter, Wellesley.
Hunt, Dudley F., Reading.
Hunt, Francis W., Melrose.
Hunt, Franklin, Charlestown, N. H.
Hunt, William H, Concord.

Jack, John George, Jamaica Plain.
Jackson, Charles L., Cambridge.
Jackson, Robert T., Boston.
James, George Abbot, Nahant.
Janvrin, William S., Revere.
Jeffries, William A., Boston.
Jenks, Charles W., Bedford.
Johnson, J. Frank, Malden.
Jones, Jerome, Brookline.
Jones, Dr. Mary E., Boston.
Jordan, Eben D., Boston.
Jordan, Henry G., Hingham.
Jose, Edwin H., Cambridgeport.

Kakas, Edward, West Medford.
Kellen, William V., Marion.
Kelley, George B., Jamaica Plain.
Kendall, D. S., Woodstock, Ont.
Kendall, Edward, Cambridgeport.
† Kendall, Joseph R., San Francisco, Cal.
Kendall, Dr. Walter G., Atlantic.
Kendrick, Mrs. H. P., Allston.
Kennedy, George G., M. D., Roxbury.
Kent, John, Chestnut Hill.
Keyes, John M., Concord.
Kidder, Charles A., Southborough.
Kidder, Nathaniel T., Milton.
† Kimball, A. P., Boston.
Kimball, David P., Boston.
King, D. Webster, Boston.
Kingman, Abner A., Brookline.
Kingman, C. D., Middleborough.
Kinney, H. R., Worcester.
Knapp, Walter H., Newtonville.

Lamb, Horatio A., Milton.
Lancaster, Charles B., Boston.
Lanier, Charles, Lenox.
Lawrence, Amory A., Boston.
Lawrence, Amos A., Boston.
Lawrence, James, Groton.
Lawrence, John, Groton.
Lawrence, Rt. Rev. William, Boston.
Learned, Charles A., Arlington.
Lee, Daniel D., Jamaica Plain.
Lee, Francis H., Salem.
Lee, George C., Newton.
Leeson, Hon. Joseph R., Newton Centre.
Lemme, Frederick, Charlestown.
Leuchars, Robert B., Dorchester.
Lincoln, George, Hingham.
Lincoln, Col. Solomon, Boston.
Little, James L., Brookline.
Little, John Mason, Swampscott.
Locke, Edwin F., West Medford.
Locke, Isaac H., Belmont.
Lockwood, Rhodes, Boston.
Lodge, Richard W., Boston.

Loftus, John P., Dorchester.
Loomis, Elihu G., Bedford.
Loring, Augustus P., Beverly.
Loring, Mrs. William Caleb, Beverly.
Lothrop, William S. H , Boston.
† Lowder, John, Watertown.
Lowell, Abbott Lawrence, Boston.
Luke, Otis H., Brookline.
Lumb, William, Boston.
Lunt, William W., Hingham.
Lyman, George H., Wareham.
Lyman, Mrs. Theodore, Brookline.

Mabbett, George, Plymouth.
Mackie, George, M. D., Attleboro.
† Mahoney, John, Boston.
Mallett, E. B., Jr., Freeport, Me.
Mann, James F., Ipswich.
Manning, Jacob W., Reading.
Manning, J. Woodward, Reading.
Manning, Mrs. Lydia B., Reading.
Manning. Robert, Salem.
Manning, Warren H., Brookline.
Marshall, Frederick F., Everett.
Marston, Howard, Boston.
Mason, Miss Ellen F., Boston.
Mason, Col. Frederick, Taunton.
Matthews, Nathan, Boston.
May, Frederick W. G., Boston.
McCarty, Timothy, Providence, R. I.
McWilliam, George, Whitinsville.
Melvin, James C., West Newton.
Merriam, Charles, Boston.
Merriam, Herbert, Weston.
Merrill, Hon. Moody, Roxbury.
Metivier, James, Cambridge.
Milmore, Mrs. Joseph, Washington, D. C.
Minot, Charles S., Milton.
Minton, James, Boston.
Mitton, Edward J., Brookline.
Mixter, George, Boston.
Monteith, David, Dedham.
Montgomery, Alexander, Natick.
Moore, George D., Arlington.
Moore, John H., Concord.
Morgan, George H., New York, N. Y.
Morse, John T., Jr., Boston.
Morse, Robert M., Jamaica Plain.
Moseley, Charles H., Dorchester.
Mudge, George A., Portsmouth, N. H.
Murdock, Albert L., Boston.
Murphy, William Bowen, Boston.
Murray, Peter, Fairhaven.
Mutch, John, Brookline.

Nevins, Mrs. David, Methuen.
Newman, John R., Winchester.
Newton, Rev. William W., Pittsfield.
Nickerson, Mrs. George A., Dedham.
Norton, Charles W., Allston.
Norton, Edward E., Boston.

Oakman, Hiram A., North Marshfield.
Olmsted, Frederick Law, Jr., Brookline.
Olmsted, John C., Brookline.
Orpet, Edward O., South Lancaster.

Page, Mrs. Henrietta, Boston.
Paige, Clifton H., Mattapan.
Parker, Charles W., Boston.
Parkman, Henry, Boston.
Parsons, John E., Lenox.
Partridge, Horace, North Cambridge.
Patten, Marcellus A., Tewksbury.
Paul, Alfred W., Dighton.
Peabody, Francis H., Boston.
Peabody, George A., Danvers.
Peabody, John E., Salem.
Peabody, S. Endicott, Salem.
Peck, O. H., Denver, Col.
Peck, William G , Arlington.
Peirce, Miss Marion W., Topsfield.
† Perry, George W., Malden.
Pfaff, Col. Charles, South Framingham.
Philbrick, William D., Newton Centre.
Phillips, John C., North Beverly.
Phillips, Mrs. John C., North Beverly.

Phillips, William, North Beverly.
Pierce, Dean, Brookline.
Pierce, Elisha N., Waltham.
Pierce, George Francis, Neponset.
Pond, Preston, Winchester.
Poor, John R., Brookline.
Pope, Col. Albert A., Cohasset.
Porter, Alexander S., Boston.
Porter, James C., Wollaston.
Porter, Hon. Joseph S., Washington, D. C.
Prang, Louis, Boston.
Pratt, Laban, Dorchester.
Pratt, Lucius G., West Newton.
Pratt, Robert M., Boston.
Prendergast, J. M., Boston.
Prescott, Eben C., New York, N. Y.
Pringle, Cyrus G., Charlotte, Vt.
Proctor, T. E., Boston.
Prouty, Gardner, Littleton.
Putnam, George, Manchester.
Putnam, George J., Brookline.
Putnam, Joshua H., Newton Centre.

Quinby, Hosea M., M.D., Worcester.

Raddin, Everett W., North Cambridge.
Rand, Harry S., North Cambridge.
Rand, Oliver J., Cambridgeport.
Rawson, Warren W., Arlington.
Ray, James F., Franklin.
Raymond, Walter, Boston.
Read, Charles A., Manchester.
Reardon, John B., Boston.
Reed, Henry R., Jamaica Plain.
Rice, George C., Worcester.
Richards, John J., Boston.
Richardson, Charles E., Brookline.
Richardson, Dr. William L., Boston.
Rinn, J. Ph., Boston.
Ripley, Charles, Dorchester.
Ripley, Ebed L., Hingham Centre.
Robbins, I. Gilbert, Melrose Highlands.
Robinson, John, Salem.
Robinson Joseph B , Dorchester.
Robinson, Warren J., Somerville.
Rogers, Mrs. Jacob C., Peabody.
Roland, Thomas, Nahant.
Rothwell, James E., Brookline.
Roy, David Frank, Malden.
Ruddick, William H., M.D., South Boston.
Russell, George, Woburn.
Russell, James S., Milton.
Russell, Hon. John E., Leicester.
Russell, Walter, Arlington.

Salisbury, William C. G., Brookline.
Saltonstall, Richard M., Newton.
Sanford, Oliver S., Hyde Park.
Sanger, Mrs. George P., Boston.
Sargent, Andrew Robeson, Brookline.
Sargent, Charles S., Brookline.
Sargent, Mrs. Charles S., Brookline.
Sargent, Mrs. Francis W., Wellesley.
Sawtelle, Eli A., Boston.
Sawyer, Timothy T., Boston.
Scorgie, James C , Cambridge.
†Scott, Charles, Newton.
Sears, Miss Clara E., Boston.
Sears, Miss Emily E., Boston.
Sears, Dr. Henry F., Boston.
Sears, J. Montgomery, Boston.
Sears, Mrs. J. Montgomery, Boston.
Shaler, Nathaniel S., Cambridge.
Sharp, Miss Helen, Boston.
Shaw, Christopher C., Milford, N. H.
Shaw, Francis, Wayland.
Shaw, Mrs. Robert G., Wellesley.
Sherman, William H., Boston.
Shorey, John L., Lynn.
Shuman, Hon. A., Roxbury.
Shurtleff, Josiah B., Jr., Revere.
Sias, Charles D., Wenham.
Siebrecht, H. A., New Rochelle, N.Y.
Simpkins, Miss Mabel, Yarmouth.
Skinner, Francis, Boston.
Skinner, Francis, Jr., Boston.

Sleeper, Henry Davis, Boston.
Smith, Archibald, West Somerville.
Smith, Calvin W., Wellesley Hills.
Smith, Charles H., Newton Highlands.
Smith, Charles S., Lincoln.
Smith, Edward N., San Francisco, Cal.
Smith, George O., East Lexington.
Smith, Thomas Page, Waltham.
Snow, Eugene A., Melrose.
Sohier, Col. William D., Beverly.
Souther, Charles H., Jamaica Plain.
Spaulding, Edward, West Newton.
Speare, Alden, Newton Centre.
Spooner, William H., Jamaica Plain.
Sprague, Hon. Charles F., Brookline.
Sprague, Isaac, Wellesley Hills.
Springall, George, Malden.
Stearns, Charles H., Brookline.
Stearns, Frank W., Newton.
Stedman, Henry R., M. D., Roslindale.
Stevens, Hon. Moses T., Andover.
Stewart, William J., Winchester.
Stone, Charles A., Newton.
Stone, Charles W., Boston.
Stone, Prof. George E., Amherst.
Stone, George F., Chestnut Hill.
Strater, Herman, Roxbury.
Strong, William C., Waban.
Swain, Charles E., Roxbury.
Sweet, Everell F., Malden.

Talbot, Mrs. I. Tisdale, Boston.
Taylor, Charles H., Boston.
Taylor, Horace B., Portland, Me.
Temple, Felker L., Boston.
Tenney, C. H., Methuen.
Thatcher, William, Brookline.
Thayer, Mrs. Alice R., Boston.
Thayer, Bayard, Lancaster.
Thayer, Mrs. Bayard, Lancaster.
Thayer, Eugene V. R., South Lancaster.
Thayer, Mrs. Eugene V. R., South Lancaster.
Thayer, John E., South Lancaster.
Thayer, Mrs. John E., South Lancaster.
Thayer, Nathaniel, Lancaster.
Thayer, Mrs. Nathaniel, Lancaster.
Thayer, S. V. R., Boston.
Thiemann, Hermann, Manchester.
Thomas, W. B., Manchester.
Thurlow, Thomas C., West Newbury.
Tilton, Stephen W., Roxbury.
Todd, John, Hingham.
Tolman, Benjamin, Concord.
Tolman, Miss Harriet S., Boston.
Toppan, Roland W., Malden.
Torrey, Everett, Charlestown.
Tower, Miss Ellen May, Lexington.
Tower, Mrs. Helen M., Cambridge.
Tower, Sylvester, Boston.
Travis, Charles B., Brighton.
Trepess, Samuel J., Glencove, L. I., N. Y.
Tucker, Lawrence, Boston.
† Turner, John M., Dorchester.

Underwood, Loring, Belmont.

Vander-Woerd, Charles, Waltham.
Vaughan, William Warren, Boston.
Vinal, Miss Mary L., Somerville.

Wakefield, E. H., Cambridge.
Walcott, Henry P., M.D., Cambridge.
Waldo, C. Sidney, Jamaica Plain.
Wales, George O., Braintree.
Walker, Miss Mary Sophia, Waltham.
Walley, Mrs. W. P., Boston.
Walsh, Michael H., Wood's Holl.
Waltham, George C., Dorchester.
Walton, Daniel G., Wakefield.
Ward, Francis Jackson, Roxbury.
Ward, John, Newton Centre.
Ware, Benjamin P., Clifton

Ware, Miss Mary L., Boston.
Warren, Samuel D., Dedham.
Washburn, Andrew, Hyde Hark.
Watson, Benjamin M., Jamaica Plain.
Watson, Thomas A., East Braintree.
Watts, Isaac, Waverly.
Webber, Aaron D., Boston.
Webster, Hollis, Cambridge.
Welch, David, Dorchester.
Weld, Christopher Minot, Jamaica Plain.
Weld, George W., Boston.
Weld, Richard H., Boston.
Weld, Gen. Stephen M., Dedham.
West, Mrs. Maria L.. Neponset.
Weston, Seth, Chelsea.
Wheeler, Frank, Concord.
Wheeler, James, Brookline.
Wheeler, Wilfred, Concord.
Wheelwright, A. C., Brookline.
Wheelwright, Edmund M., Boston.
Whitcomb, William B., Medford.
White, Mrs. Charles T., Boston.
White, Francis A., Brookline.
White, George R., Boston.
White, Joseph H., Brookline.
Whitney, Arthur E., Winchester.
Whitney, Ellerton P., Milton.
Whitney, Henry M., Cohasset.
Whittier, George E., Groton.
Whittier, William Benjamin, South Framingham.
Wigglesworth, George, Milton.
Wilbur, George B , West Newton.
Wilder, Edward Baker, Dorchester.
Wilder, Henry A., Malden.
Willard, E. W., Newport, R. I.
Willcutt, Levi L., Brookline.
Williams, Miss Adelia Coffin, Roxbury.
Williams, Benjamin B., Boston.
Williams, Henry Bigelow, Boston.
Williams, John Davis, Boston.
Williams, Philander, Taunton.
Willis, George W., Chelsea.
Willis, Joshua C., Roxbury.
Wilson, Col. Henry W., Boston.
Wilson, William Power, Boston.
Winthrop, Robert C., Jr., Boston.
Wood, William K., West Newton.
Woods, Henry, Boston.
Wright, George C., West Acton.
Wright, John G., Brookline.
Wyman, Oliver B., Shrewsbury.
Wyman, Windsor H., North Abington.

ANNUAL MEMBERS.

Members of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly communicating to the Secretary the needed corrections.

Allen, Charles L., Floral Park, N.Y.
Alles, William H., Chestnut Hill.
Anderson, George M., Milton.
Arnold, Miss Sarah L., Newton Centre.
Atkinson, Edward, Brookline.
Ayres, Miss Helen F., Medford.

Barker, John G., Melrose.
Barr, John, Wellesley.
Bigelow, Arthur J., Eastlake, Worcester.
Bigelow, Mrs. Nancy J., Southborough.
Bird, John L., Dorchester.
Blomberg, Carl, North Easton.
Bock, William A., North Cambridge.
Bolles, William P., M.D., Roxbury.
Boyden, Clarence F., Taunton.
Bradley, Miss Abby A., Hingham.
Braman, George H., Newton.
Breck, Charles H., Newton.
Brunton, Frank, Stockbridge.
Butler, Edward, Wellesley.

Carpenter, Frank O., West Roxbury.
Carter, Mrs. Sarah D. J., Wilmington.
Cary, Miss Alice B., Lexington.
Chase, Joseph S., Malden.
Chase, Philip A., Lynn.
Chubbuck, Isaac Y., Roxbury.
Clapp, Henry L., Roxbury.
Clark, John W., North Hadley.
Clark, Joseph, Manchester.
Clark, Theodore M., Newtonville.
Clinkaberry, Henry T., Trenton, N. J.
Collins, Frank S., Malden.
Comley, James, Lexington.
Coolidge, Dr. Sumner, East Watertown.
Cotter, Lawrence, Dorchester.
Cotting, Charles U., Boston.
Crosby, J. Allen, Jamaica Plain.
Curtis, Joseph H., Boston.
Curtis, Louville, Tyngsborough.

Davis, Frederick S., West Roxbury.
Dawson, Charles Jackson, Newark, N. J.
Derby, William H., Revere.
Dolbear, Mrs. Alice J., College Hill.
Dorr, George B., Boston.
Doyle, William E., East Cambridge.
Duffley, Daniel, Brookline.

Eastman, Edmund C., Brookline.
Eaton, Warren E., Reading.
Endicott, Miss Charlotte M , Canton.
Eustis, William Tracy, Brookline.
Ewell, Marshall F., Marshfield Hills.

Fenno, Warren, Revere.
Fisher, Sewell, Framingham.
Fiske, Harry E., Wollaston.

Fitzgerald, Desmond, Brookline.
Fletcher, Fred W., Auburndale.
Forbes, William H., Jamaica Plain.
Francis, George E., M.D., Worcester.
Fuller, T. Otis, Needham.

Gill, Mrs. E. M., Medford.
Gilman, Hon. Virgil C., Nashua, N. H.
Grant, Charles E., Concord.
Grew, Henry Sturgis, Boston.
Grey, Robert Melrose, North Easton.
Grey, Thomas J., Chelsea.

Hall, Charles H., M.D., Corning, Cal.
Hall, Stacy, Boston.
Hallstram, Charles W., Boston.
Ham, Fernald E., Burlington.
Hargraves, William J., Jamaica Plain.
Harris, Frederick L., Wellesley.
Harrison, C. S., York, Nebraska.
Harrison, Thomas, Melrose Highlands.
Hartwell, Samuel, Lincoln.
Hatfield, T. D., Wellesley.
Hersey, Edmund, Hingham.
Heustis, Warren H., Belmont.
Hill, J. Willard, Belmont.
Hinds, Warren D., Townsend.
Hobbs, George M., Boston.
Hollis, George, South Weymouth.
Houghton, George S., West Newton.
Howden, Thomas, Whitinsville.
Hubbard, F. Tracey, Cambridge.
Huston, Miss Katharine W., Jamaica Plain.

Illenberger, Henry, Brookline.
Ireland, Robert D., Winthrop.

James, Robert Kent, Dorchester.
Jameson, G. W., East Lexington.

Keith, Mrs. Mary R., Washington, D. C.
Kelsey, Harlan P., Boston.
Kemp, William S., Brookline.
Kennard, Frederic H., Brookline.

Lancaster, Mrs. E. M., Roxbury.
Laurie, Robert, Newport, R. I.
Lawson, Joshua, Brookline.
Lincoln, Miss Agnes W., Medford.
Lomax, George H., Somerville.
Loring, Charles G., Boston.
Loring, Mrs. Thacher, Brookline.
Loring, William C., Beverly.
Lothrop, Thornton K., Boston.
Low, Hon. Aaron, Hingham.

Manda, W. A., South Orange, N. J.
Manning, A. Chandler, Reading.
Martin, William J , Milton.
Maynard, Charles, North Easton.
McLaren, Anthony, Westwood.
Meriam, Horatio C., D.M.D., Salem.
Metcalf, Dr. Ben H., Winthrop.
Milman, William, Roxbury.
Moody, Abner J., Boston.
Morgan, George M., Boston.
Morrison, William, Cohasset.
Moseley, Frederick C., Dorchester.
Moseley, Frederick Strong, Newburyport.
Munson, Prof. W. M., Orono, Me.

Newton, John F., Roxbury.
Nicholson, William, Framingham.
Norton, Michael H., Boston.
Norton, Patrick, Dorchester.

Olmsted, Frederick Law, Brookline.

Park, William D., Boston.
Parker, John, Newtonville.
Parker, Walter S., Reading.
Patterson, William, Quincy.
Peirce, George H., Concord Junction.

Petremant, Robert, Brooklyn, N. Y.
Pettigrew, John A., Jamaica Plain.
Pickman, Dudley L., Boston.
Pierce, Mrs. F. A., Brookline.
Plimpton, Willard P., West Newton.
Pray, James Sturgis, Cambridge.
Purdie, George A., Ormond, Florida.

Rea, Charles H., Norwood.
Rea, Frederic J., Norwood.
Rich, Miss Ruth G., Dorchester.
Rich, William E. C., Roxbury.
Rich, William P., Chelsea.
Richards, Mrs. P. D., West Medford.
Robb, Peter B., Whitinsville.
Robbins, Oliver R., Weston.
Robinson, Walter A., Arlington.
Rodman, Miss Mary, Concord.
Ross, Charles W., Newtonville.
Ross, Henry Wilson, Newtonville.

Sander, Charles, Brookline.
Saunders, Miss Mary T., Salem.
Scott, Augustus E., Lexington.
Scudder, Samuel H., Cambridge.
Searles, E. F., Methuen.
Seaver, Edwin P., Waban.
Sharples, Stephen P., Cambridge.
Shaw, Hon. Edward P., Newburyport.
Shea, James B., Jamaica Plain.
Shepard Harvey N., Boston.
Sheppard, Edwin, Lowell.
Southworth, Edward, Quincy.
Squire, Miss Esther A., North Cambridge.
Stevens, Mrs. Mary L., Cambridge.
Stone, Joshua C., Watertown.
Story, Miss Sarah W., Brighton.
Strange, David T., Stoneham.
Sullivan, Michael, Revere.
Sutherland, George A., Roslindale.
Swan, Charles W., M.D., Brookline.

Tailby, Joseph, Wellesley.
Teele, William H., West Acton.
Tobey, Rufus T., Roxbury.
Tyler, Mrs. John F., North Andover.
Tyndale, Theodore H., Brookline.

Vaughan, J. C., Chicago, Ill.

Warren, Samuel H., Weston.
Welch, Patrick, Dorchester.
Westwood, Thomas H., Jamaica Plain.
Wheeler, Henry A., Newtonville.
White, Maurice P., Roxbury.
White, W. Henry, Lowell.
Whitney, Joseph, Cambridgeport.
Whiton, Hon. Starkes, Hingham Centre.
Wilder, Miss Grace S., Dorchester.
Wilder, Miss Jemima R., Dorchester.
Wilkie, Edward A., Newtonville.
Winter, William C., Mansfield.
Wolcott, Mrs. H. L. T., Dedham.
Wood, Mrs. Anna D , West Newton.
Wood, Elijah A., West Newton.
Wood, E. W., West Newton.
Woodford, Joseph H., Boston.
Woods, Henry F., Boston.

Young, E. Bentley, Boston.

Zirngiebel, Denys, Needham.

EXTRACTS FROM THE CONSTITUTION AND BY-LAWS.

SECTION XXII.

Life Members.

The payment of thirty dollars shall constitute a Life Membership, and exempt the member from all future assessments, and any Annual Member, having paid all dues, may become a Life Member by the payment of twenty dollars in addition thereto.

Annual Membership.

Every Annual Member, before he receives his diploma, or exercises the privileges of a member, shall pay the sum of ten dollars as an admission fee, and shall be subject afterwards to an annual assessment of two dollars.

SECTION XXIII.

Withdrawal or Discontinuance of Membership.

Any member may withdraw from the Society, on giving notice to the Treasurer and paying the amount due from him. Any member who shall neglect for the space of two years to pay his annual assessment, after due notice from the Treasurer, shall cease to be a member. The Treasurer shall give notice of such withdrawals, or discontinuances to the Secretary, who shall erase such members' names from the list.

The attention of Annual Members is particularly called to Section XXIII.

HONORARY MEMBERS.

Members and correspondents of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly communicating to the Secretary the needed corrections.

Information, or any clew to it, is especially desired in regard to Joseph Maxwell, *elected in* 1830, *and* George W. Smith, *elected in* 1851.

Hon. George S. Boutwell, Groton.

Clarence H. Clark, Ex-President of the Pennsylvania Horticultural Society, Philadelphia.

Joseph Jefferson, Buzzard's Bay.

Major L. A. Huguet-Latour, M. P., Montreal, Canada.

Sir Trevor Lawrence, President of the Royal Horticultural Society, London.

Joseph Maxwell, Rio Janeiro, Brazil.

Donald G. Mitchell, New Haven, Conn.

Hon. J. Sterling Morton, Ex-Secretary of Agriculture, Nebraska City, Neb.

Baron R. Von Osten Sacken, Heidelberg, Germany.

Samuel B. Parsons, Flushing, N. Y.

Dr. Henry S. Pritchett, President of the Massachusetts Institute of Technology, Boston.

George W. Smith, Boston.

Albert Viger, President of the National Society of Horticulture of France, Paris.

Hon. James Wilson, Secretary of Agriculture, Washington, D. C.

CORRESPONDING MEMBERS.

Members and correspondents of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly reporting to the Secretary the needed corrections.

Information, or any clew to it, is especially desired in regard to Alexander Burton, *elected in* 1829; S. Reynolds, M.D., 1832; *and* Francis Summerest (or Summerer), 1833.

Édouard André, Editor-in-chief of the Revue Horticole, Paris, France.

George Francis Atkinson, Professor of Botany in Cornell University, Ithaca, N. Y.

Professor L. H. Bailey, Horticultural Department, Cornell University, Ithaca, N. Y.

John Gilbert Baker, F. R. S., F. L. S., Kew, England.

Charles Baltet, Président de la Société Horticole, Vigneronne, et Forestière de l' Aube, Troyes, France.

Peter Barr, London, England.

Archibald F. Barron, Turnham Green, London, W.

Napoleon Baumann, Bolwiller, Alsace.

D. W. Beadle, 303 Crawford St., Toronto, Ontario.

Professor William J. Beal, Agricultural College, Michigan.

Prosper J. Berckmans, Ex-President of the American Pomological Society, Augusta, Ga.

Charles E. Bessey, Ph. D., Professor of Botany in the Industrial College of the University of Nebraska, Lincoln.

Dr. Ch. Bolle, Berlin, Prussia.

Col. Gustavus B. Brackett, Pomologist to the United States Department of Agriculture, Washington, D. C.

John Croumbie Brown, LL.D., Haddington, Scotland.

Professor J. L. Budd, Ames, Iowa.

William Bull, Chelsea, England.

F. W. Burbidge, M.A., Trinity College Botanic Garden, Dublin, Ireland.

Alexander Burton, United States Consul at Cadiz, Spain, Philadelphia

Daniel T. Curtis, Dorchester.

Rev. H. Honywood D'Ombrain, Westwell Vicarage, Ashford, Kent, England.

Sir W. T. Thiselton Dyer, K. C. M. G., F. R. S., Director of the Royal Botanic Gardens, Kew, England.

Finlayson, Kenneth, Brookline.
Fisher, Peter, Ellis.
Flagg, Augustus, Boston.
Fletcher, George V., Belmont.
Fletcher, J. Henry, Belmont.
Fletcher, John W., Chelsea.
Flint, David B., Boston.
Foster, Charles H. W., Brookline.
Foster, Francis C., Cambridge.
Fottler, John, Jr., Dorchester.
Fowle, George W., Jamaica Plain.
Fowle, William B., Auburndale.
French, Miss Caroline L. W. Boston.
French, S. Waldo, Jamaica Plain.
French, W. Clifford, Cambridge.
Frohock, Roscoe R., Malden.
Frost, Irving B., Belmont.
Frost, Varnum, Arlington.

Galloupe, Charles W., Swampscott.
Galvin, John, Boston.
Gardner, Mrs. Augustus P., Hamilton,
Gardner, George A., Boston.
Gardner, George P., Boston.
Gardner, John L., Boston.
Gardner, Mrs. John L., Brookline.
Gardner, William Amory, Groton.
Gaston, William A., Boston.
Gibbs, Wolcott, M.D., Newport, R.I.
Gill, George B., Medford.
Gillard, William, Dorchester.
Gilmore, E. W., North Easton.
Gilson, F. Howard, Wellesley Hills.
Glover, Joseph B., Boston.
Goddard, Joseph, Sharon.
Goodell, L. W., Dwight.
Gorham, James L., Jamaica Plain.
† Gould, Samuel, Boston.
Gowing, Mrs. Clara E., Kendal Green.
Gray, James, Wellesley.
Gray, Mrs. John C., Boston.
Gregory, Hon. James J. H., Marblehead.
Grew, Edward S., Boston.
Grey, Benjamin, Malden.

Hadwen, Obadiah B., Worcester.
Hale, James O., Byfield.
Hall, Edwin A., Cambridgeport.
Hall, George A., Chelsea.
Hall, Jackson E., Boston.
Hall, Osborn B., Malden.
Hall, William F., Brookline.
Halliday, William H., South Boston.
Hammond, Gardiner G, New London, Conn.
Hammond, George W., Boston.
† Harding, George W., Arlington.
Harding, Louis B., Chestnut Hill.
Hardy, F. D., Cambridgeport.
Harlow, James F., Quincy.
Harris, Charles, Cambridge.
Harris, Thaddeus William, A.M., Keene, N. H.
Hartshorn, Arthur E., Worcester.
Harwood, George Fred, Newton.
Haskell, Edwin B., Auburndale.
Hastings, Levi W., Brookline.
Hatch, Mrs. C. S., North Cambridge.
Hatch, Edward, Boston.
Haven, Franklin, Boston.
Hawken, Mrs. Thomas, Rockland, Me.
Hayward, George P., Roxbury.
† Hazeltine, Hazen, Boston.
Hemenway, Augustus, Canton.
Hemenway, Mrs. Augustus, Canton.
Henshaw, Joseph P. B., Boston.
Henshaw, Samuel, Cambridge.
Heurlin, Julius, South Braintree.
Hewett, Miss Mary C., Canton.
Hews, Albert H., North Cambridge.
Higginson, Francis L., Boston.
Hilbourn, A. J., Boston.
Hill, John, Stoneham.
Hittinger, Jacob, Mt. Auburn.
Hoar, Samuel, Concord.
Hodgkins, John E., Portsmouth, N.H.

Hoitt, Hon. Charles W., Nashua, N. H.
Hollingsworth, Amor L., Milton.
Hollingsworth, Z. T., Boston.
Hollis, George W., Grantville.
Holmes, Edward J., Boston.
Holt, Gustavus C., Belmont.
Holt, Mrs. Stephen A., Cambridge.
Holt, William W., Winchester.
Hooper, William, Boston.
Horner, Mrs. Charlotte N.S., Georgetown.
Horsford, Miss Kate, Cambridge.
Hovey, Charles H., South Pasadena, Cal.
Hovey, Stillman S., Woburn.
Howard, Joseph W., Somerville.
Hubbard, Charles Wells, Weston.
Hubbard, James C., Everett.
Humphrey, George W., Dedham.
Hunnewell, Arthur, Wellesley.
Hunnewell, Henry Sargent, Wellesley.
Hunnewell, H. Hollis, Wellesley.
Hunnewell, Walter, Wellesley.
Hunt, Dudley F., Reading.
Hunt, Francis W., Melrose.
Hunt, Franklin, Charlestown, N. H.
Hunt, William H , Concord.

Jack, John George, Jamaica Plain.
Jackson, Charles L., Cambridge.
Jackson, Robert T., Boston.
James, George Abbot, Nahant.
Janvrin, William S., Revere.
Jeffries, William A., Boston.
Jenks, Charles W., Bedford.
Johnson, J. Frank, Malden.
Jones, Jerome, Brookline.
Jones, Dr. Mary E., Boston.
Jordan, Eben D., Boston.
Jordan, Henry G., Hingham.
Jose, Edwin H., Cambridgeport.

Kakas, Edward, West Medford.
Kellen, William V., Marion.
Kelley, George B., Jamaica Plain.
Kendall, D. S., Woodstock, Ont.
Kendall, Edward, Cambridgeport.
† Kendall, Joseph R., San Francisco, Cal.
Kendall, Dr. Walter G., Atlantic.
Kendrick, Mrs. H. P., Allston.
Kennedy, George G., M. D., Roxbury.
Kent, John, Chestnut Hill.
Keyes, John M., Concord.
Kidder, Charles A., Southborough.
Kidder, Nathaniel T., Milton.
† Kimball, A. P., Boston.
Kimball, David P., Boston.
King, D. Webster, Boston.
Kingman, Abner A., Brookline.
Kingman, C. D., Middleborough.
Kinney, H. R., Worcester.
Knapp, Walter H., Newtonville.

Lamb, Horatio A., Milton.
Lancaster, Charles B., Boston.
Lanier, Charles, Lenox.
Lawrence, Amory A., Boston.
Lawrence, Amos A., Boston.
Lawrence, James, Groton.
Lawrence, John, Groton.
Lawrence, Rt. Rev. William, Boston.
Learned, Charles A., Arlington.
Lee, Daniel D., Jamaica Plain.
Lee, Francis H., Salem.
Lee, George C., Newton.
Leeson, Hon. Joseph R., Newton Centre.
Lemme, Frederick, Charlestown.
Leuchars, Robert B., Dorchester.
Lincoln, George, Hingham.
Lincoln, Col. Solomon, Boston.
Little, James L., Brookline.
Little, John Mason, Swampscott.
Locke, Edwin F., West Medford.
Locke, Isaac H., Belmont.
Lockwood, Rhodes, Boston.
Lodge, Richard W., Boston.

Loftus, John P., Dorchester.
Loomis, Elihu G., Bedford.
Loring, Augustus P., Beverly.
Loring, Mrs. William Caleb, Beverly.
Lothrop, William S. H , Boston.
† Lowder, John, Watertown.
Lowell, Abbott Lawrence, Boston.
Luke, Otis H., Brookline.
Lumb, William, Boston.
Lunt, William W., Hingham.
Lyman, George H., Wareham.
Lyman, Mrs. Theodore, Brookline.

Mabbett, George, Plymouth.
Mackie, George, M. D., Attleboro.
† Mahoney, John, Boston.
Mallett, E. B., Jr., Freeport, Me.
Mann, James F., Ipswich.
Manning, Jacob W., Reading.
Manning, J. Woodward, Reading.
Manning, Mrs. Lydia B., Reading.
Manning. Robert, Salem.
Manning, Warren H., Brookline.
Marshall, Frederick F., Everett.
Marston, Howard, Boston.
Mason, Miss Ellen F., Boston.
Mason, Col. Frederick, Taunton.
Matthews, Nathan, Boston.
May, Frederick W. G., Boston.
McCarty, Timothy, Providence, R. I.
McWilliam, George, Whitinsville.
Melvin, James C., West Newton.
Merriam, Charles, Boston.
Merriam, Herbert, Weston.
Merrill, Hon. Moody, Roxbury.
Metivier, James, Cambridge.
Milmore, Mrs. Joseph, Washington, D. C.
Minot, Charles S., Milton.
Minton, James, Boston.
Mitton, Edward J., Brookline.
Mixter, George, Boston.
Monteith, David, Dedham.
Montgomery, Alexander, Natick.
Moore, George D., Arlington.
Moore, John H., Concord.
Morgan, George H., New York, N. Y.
Morse, John T., Jr., Boston.
Morse, Robert M., Jamaica Plain.
Moseley, Charles H., Dorchester.
Mudge, George A., Portsmouth, N. H.
Murdock, Albert L., Boston.
Murphy, William Bowen, Boston.
Murray, Peter, Fairhaven.
Mutch, John, Brookline.

Nevins, Mrs. David, Methuen.
Newman, John R., Winchester.
Newton, Rev. William W., Pittsfield.
Nickerson, Mrs. George A., Dedham.
Norton, Charles W., Allston.
Norton, Edward E., Boston.

Oakman, Hiram A., North Marshfield.
Olmsted, Frederick Law, Jr., Brookline.
Olmsted, John C., Brookline.
Orpet, Edward O., South Lancaster.

Page, Mrs. Henrietta, Boston.
Paige, Clifton H., Mattapan.
Parker, Charles W., Boston.
Parkman, Henry, Boston.
Parsons, John E., Lenox.
Partridge, Horace, North Cambridge.
Patten, Marcellus A., Tewksbury.
Paul, Alfred W., Dighton.
Peabody, Francis H., Boston.
Peabody, George A., Danvers.
Peabody, John E., Salem.
Peabody, S. Endicott, Salem.
Peck, O. H., Denver, Col.
Peck, William G , Arlington.
Peirce, Miss Marion W., Topsfield.
† Perry, George W., Malden.
Pfaff, Col. Charles, South Framingham.
Philbrick, William D., Newton Centre.
Phillips, John C., North Beverly.
Phillips, Mrs. John C., North Beverly.

Phillips, William, North Beverly.
Pierce, Dean, Brookline.
Pierce, Elisha N., Waltham.
Pierce, George Francis, Neponset.
Pond, Preston, Winchester.
Poor, John R., Brookline.
Pope, Col. Albert A., Cohasset.
Porter, Alexander S., Boston.
Porter, James C., Wollaston.
Porter, Hon. Joseph S., Washington, D. C.
Prang, Louis, Boston.
Pratt, Laban, Dorchester.
Pratt, Lucius G., West Newton.
Pratt, Robert M., Boston.
Prendergast, J. M., Boston.
Prescott, Eben C., New York, N. Y.
Pringle, Cyrus G., Charlotte, Vt.
Proctor, T. E., Boston.
Prouty, Gardner, Littleton.
Putnam, George, Manchester.
Putnam, George J., Brookline.
Putnam, Joshua H., Newton Centre.

Quinby, Hosea M., M.D., Worcester.

Raddin, Everett W., North Cambridge.
Rand, Harry S., North Cambridge.
Rand, Oliver J., Cambridgeport.
Rawson, Warren W., Arlington.
Ray, James F., Franklin.
Raymond, Walter, Boston.
Read, Charles A., Manchester.
Reardon, John B., Boston.
Reed, Henry R., Jamaica Plain.
Rice, George C., Worcester.
Richards, John J., Boston.
Richardson, Charles E., Brookline.
Richardson, Dr. William L., Boston.
Rinn, J. Ph., Boston.
Ripley, Charles, Dorchester.
Ripley, Ebed L., Hingham Centre.
Robbins, I. Gilbert, Melrose Highlands.
Robinson, John, Salem.
Robinson Joseph B , Dorchester.
Robinson, Warren J., Somerville.
Rogers, Mrs. Jacob C., Peabody.
Roland, Thomas, Nahant.
Rothwell, James E., Brookline.
Roy, David Frank, Malden.
Ruddick, William H., M.D., South Boston.
Russell, George, Woburn.
Russell, James S., Milton.
Russell, Hon. John E., Leicester.
Russell, Walter, Arlington.

Salisbury, William C. G., Brookline.
Saltonstall, Richard M., Newton.
Sanford, Oliver S., Hyde Park.
Sanger, Mrs. George P., Boston.
Sargent, Andrew Robeson, Brookline.
Sargent, Charles S., Brookline.
Sargent, Mrs. Charles S., Brookline.
Sargent, Mrs. Francis W., Wellesley.
Sawtelle, Eli A., Boston.
Sawyer, Timothy T., Boston.
Scorgie, James C , Cambridge.
†Scott, Charles, Newton.
Sears, Miss Clara E., Boston.
Sears, Miss Emily E., Boston.
Sears, Dr. Henry F., Boston.
Sears, J. Montgomery, Boston.
Sears, Mrs. J. Montgomery, Boston.
Shaler, Nathaniel S., Cambridge.
Sharp, Miss Helen, Boston.
Shaw, Christopher C., Milford, N. H.
Shaw, Francis, Wayland.
Shaw, Mrs. Robert G., Wellesley.
Sherman, William H., Boston.
Shorey, John L., Lynn.
Shuman, Hon. A., Roxbury.
Shurtleff, Josiah B., Jr., Revere.
Sias, Charles D., Wenham.
Siebrecht, H. A., New Rochelle, N.Y.
Simpkins, Miss Mabel, Yarmouth.
Skinner, Francis, Boston.
Skinner, Francis, Jr., Boston.

Sleeper, Henry Davis, Boston.
Smith, Archibald, West Somerville.
Smith, Calvin W., Wellesley Hills.
Smith, Charles H., Newton Highlands.
Smith, Charles S., Lincoln.
Smith, Edward N., San Francisco, Cal.
Smith, George O., East Lexington.
Smith, Thomas Page, Waltham.
Snow, Eugene A., Melrose.
Sohier, Col. William D., Beverly.
Souther, Charles H., Jamaica Plain.
Spaulding, Edward, West Newton.
Speare, Alden, Newton Centre.
Spooner, William H., Jamaica Plain.
Sprague, Hon. Charles F., Brookline.
Sprague, Isaac, Wellesley Hills.
Springall, George, Malden.
Stearns, Charles H., Brookline.
Stearns, Frank W., Newton.
Stedman, Henry R., M. D., Roslindale.
Stevens, Hon. Moses T., Andover.
Stewart, William J., Winchester.
Stone, Charles A., Newton.
Stone, Charles W., Boston.
Stone, Prof. George E., Amherst.
Stone, George F., Chestnut Hill.
Strater, Herman, Roxbury.
Strong, William C., Waban.
Swain, Charles E., Roxbury.
Sweet, Everell F., Malden.

Talbot, Mrs. I. Tisdale, Boston.
Taylor, Charles H., Boston.
Taylor, Horace B., Portland, Me.
Temple, Felker L., Boston.
Tenney, C. H., Methuen.
Thatcher, William, Brookline.
Thayer, Mrs. Alice R., Boston.
Thayer, Bayard, Lancaster.
Thayer, Mrs. Bayard, Lancaster.
Thayer, Eugene V. R., South Lancaster.
Thayer, Mrs. Eugene V. R., South Lancaster.
Thayer, John E., South Lancaster.
Thayer, Mrs. John E., South Lancaster.
Thayer, Nathaniel, Lancaster.
Thayer, Mrs. Nathaniel, Lancaster.
Thayer, S. V. R., Boston.
Thiemann, Hermann, Manchester.
Thomas, W. B., Manchester.
Thurlow, Thomas C., West Newbury.
Tilton, Stephen W., Roxbury.
Todd, John, Hingham.
Tolman, Benjamin, Concord.
Tolman, Miss Harriet S., Boston.
Toppan, Roland W., Malden.
Torrey, Everett, Charlestown.
Tower, Miss Ellen May, Lexington.
Tower, Mrs. Helen M., Cambridge.
Tower, Sylvester, Boston.
Travis, Charles B., Brighton.
Trepess, Samuel J., Glencove, L. I., N. Y.
Tucker, Lawrence, Boston.
† Turner, John M., Dorchester.

Underwood, Loring, Belmont.

Vander-Woerd, Charles, Waltham.
Vaughan, William Warren, Boston.
Vinal, Miss Mary L., Somerville.

Wakefield, E. H., Cambridge.
Walcott, Henry P., M.D., Cambridge.
Waldo, C. Sidney, Jamaica Plain.
Wales, George O., Braintree.
Walker, Miss Mary Sophia, Waltham.
Walley, Mrs. W. P., Boston.
Walsh, Michael H., Wood's Holl.
Waltham, George C., Dorchester.
Walton, Daniel G., Wakefield.
Ward, Francis Jackson, Roxbury.
Ward, John, Newton Centre.
Ware, Benjamin P., Clifton

Ware, Miss Mary L., Boston.
Warren, Samuel D., Dedham.
Washburn, Andrew, Hyde Hark.
Watson, Benjamin M., Jamaica Plain.
Watson, Thomas A., East Braintree.
Watts, Isaac, Waverly.
Webber, Aaron D., Boston.
Webster, Hollis, Cambridge.
Welch, David, Dorchester.
Weld, Christopher Minot, Jamaica Plain.
Weld, George W., Boston.
Weld, Richard H., Boston.
Weld, Gen. Stephen M., Dedham.
West, Mrs. Maria L.. Neponset.
Weston, Seth, Chelsea.
Wheeler, Frank, Concord.
Wheeler, James, Brookline.
Wheeler, Wilfred, Concord.
Wheelwright, A. C., Brookline.
Wheelwright, Edmund M., Boston.
Whitcomb, William B., Medford.
White, Mrs. Charles T., Boston.
White, Francis A , Brookline.
White, George R., Boston.
White, Joseph H., Brookline.
Whitney, Arthur E., Winchester.
Whitney, Ellerton P., Milton.
Whitney, Henry M., Cohasset.
Whittier, George E., Groton.
Whittier, William Benjamin, South Framingham.
Wigglesworth, George, Milton.
Wilbur, George B , West Newton.
Wilder, Edward Baker, Dorchester.
Wilder, Henry A., Malden.
Willard, E. W., Newport, R. I.
Willcutt, Levi L., Brookline.
Williams, Miss Adelia Coffin, Roxbury.
Williams, Benjamin B., Boston.
Williams, Henry Bigelow, Boston.
Williams, John Davis, Boston.
Williams, Philander, Taunton.
Willis, George W., Chelsea.
Willis, Joshua C., Roxbury.
Wilson, Col. Henry W., Boston.
Wilson, William Power, Boston.
Winthrop, Robert C., Jr., Boston.
Wood, William K., West Newton.
Woods, Henry, Boston.
Wright, George C., West Acton.
Wright, John G., Brookline.
Wyman, Oliver B., Shrewsbury.
Wyman, Windsor H., North Abington.

ANNUAL MEMBERS.

Members of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly communicating to the Secretary the needed corrections.

Allen, Charles L., Floral Park, N.Y.
Alles, William H., Chestnut Hill.
Anderson, George M., Milton.
Arnold, Miss Sarah L., Newton Centre.
Atkinson, Edward, Brookline.
Ayres, Miss Helen F., Medford.

Barker, John G., Melrose.
Barr, John, Wellesley.
Bigelow, Arthur J., Eastlake, Worcester.
Bigelow, Mrs. Nancy J., Southborough.
Bird, John L., Dorchester.
Blomberg, Carl, North Easton.
Bock, William A., North Cambridge.
Bolles, William P., M.D., Roxbury.
Boyden, Clarence F., Taunton.
Bradley, Miss Abby A., Hingham.
Braman, George H., Newton.
Breck, Charles H., Newton.
Brunton, Frank, Stockbridge.
Butler, Edward, Wellesley.

Carpenter, Frank O., West Roxbury.
Carter, Mrs. Sarah D. J., Wilmington.
Cary, Miss Alice B., Lexington.
Chase, Joseph S., Malden.
Chase, Philip A., Lynn.
Chubbuck, Isaac Y., Roxbury.
Clapp, Henry L., Roxbury.
Clark, John W., North Hadley.
Clark, Joseph, Manchester.
Clark, Theodore M., Newtonville.
Clinkaberry, Henry T., Trenton, N. J.
Collins, Frank S., Malden.
Comley, James, Lexington.
Coolidge, Dr. Sumner, East Watertown.
Cotter, Lawrence, Dorchester.
Cotting, Charles U., Boston.
Crosby, J. Allen, Jamaica Plain.
Curtis, Joseph H., Boston.
Curtis, Louville, Tyngsborough.

Davis, Frederick S., West Roxbury.
Dawson, Charles Jackson, Newark, N. J.
Derby, William H., Revere.
Dolbear, Mrs. Alice J., College Hill.
Dorr, George B., Boston.
Doyle, William E., East Cambridge.
Duffley, Daniel, Brookline.

Eastman, Edmund C., Brookline.
Eaton, Warren E., Reading.
Endicott, Miss Charlotte M., Canton.
Eustis, William Tracy, Brookline.
Ewell, Marshall F., Marshfield Hills.

Fenno, Warren, Revere.
Fisher, Sewell, Framingham.
Fiske, Harry E., Wollaston.

Fitzgerald, Desmond, Brookline.
Fletcher, Fred W., Auburndale.
Forbes, William H., Jamaica Plain.
Francis, George E., M.D., Worcester.
Fuller, T. Otis, Needham.

Gill, Mrs. E. M., Medford.
Gilman, Hon. Virgil C., Nashua, N. H.
Grant, Charles E., Concord.
Grew, Henry Sturgis, Boston.
Grey, Robert Melrose, North Easton.
Grey, Thomas J., Chelsea.

Hall, Charles H., M.D., Corning, Cal.
Hall, Stacy, Boston.
Hallstram, Charles W., Boston.
Ham, Fernald E., Burlington.
Hargraves, William J., Jamaica Plain.
Harris, Frederick L., Wellesley.
Harrison, C. S., York, Nebraska.
Harrison, Thomas, Melrose Highlands.
Hartwell, Samuel, Lincoln.
Hatfield, T. D., Wellesley.
Hersey, Edmund, Hingham.
Heustis, Warren H., Belmont.
Hill, J. Willard, Belmont.
Hinds, Warren D., Townsend.
Hobbs, George M., Boston.
Hollis, George, South Weymouth.
Houghton, George S., West Newton.
Howden, Thomas, Whitinsville.
Hubbard, F. Tracey, Cambridge.
Huston, Miss Katharine W., Jamaica Plain.

Illenberger, Henry, Brookline.
Ireland, Robert D., Winthrop.

James, Robert Kent, Dorchester.
Jameson, G. W., East Lexington.

Keith, Mrs. Mary R., Washington, D. C.
Kelsey, Harlan P., Boston.
Kemp, William S., Brookline.
Kennard, Frederic H., Brookline.

Lancaster, Mrs. E. M., Roxbury.
Laurie, Robert, Newport, R. I.
Lawson, Joshua, Brookline.
Lincoln, Miss Agnes W., Medford.
Lomax, George H., Somerville.
Loring, Charles G., Boston.
Loring, Mrs. Thacher, Brookline.
Loring, William C., Beverly.
Lothrop, Thornton K., Boston.
Low, Hon. Aaron, Hingham.

Manda, W. A., South Orange, N. J.
Manning, A. Chandler, Reading.
Martin, William J, Milton.
Maynard, Charles, North Easton.
McLaren, Anthony, Westwood.
Meriam, Horatio C., D.M.D., Salem.
Metcalf, Dr. Ben H., Winthrop.
Milman, William, Roxbury.
Moody, Abner J., Boston.
Morgan, George M., Boston.
Morrison, William, Cohasset.
Moseley, Frederick C., Dorchester.
Moseley, Frederick Strong, Newburyport.
Munson, Prof. W. M., Orono, Me.

Newton, John F., Roxbury.
Nicholson, William, Framingham.
Norton, Michael H., Boston.
Norton, Patrick, Dorchester.

Olmsted, Frederick Law, Brookline.

Park, William D., Boston.
Parker, John, Newtonville.
Parker, Walter S., Reading.
Patterson, William, Quincy.
Peirce, George H., Concord Junction.

Forestry and Roadside Improvement.

HARVEY N. SHEPARD, CHAIRMAN.

NATHANIEL S. SHALER. HENRY S. HUNNEWELL.
J. WOODWARD MANNING. JAMES STURGIS PRAY, SECRETARY.

Gardens.

PATRICK NORTON, OF DORCHESTER, CHAIRMAN.

CHAIRMEN OF THE COMMITTEES ON PLANTS, FLOWERS, FRUITS, VEGETABLES, AND ARRANGEMENTS, *Ex officiis.*

HENRY W. WILSON. JACKSON T. DAWSON.

For Establishing Prizes.

WILLIAM H. ELLIOTT, OF BRIGHTON, CHAIRMAN.

CHAIRMEN OF THE COMMITTEES ON PLANTS, FLOWERS, FRUITS, VEGETABLES, AND GARDENS, *Ex officiis.*

WILLIAM J. MARTIN.

Committee of Arrangements.

JOSEPH H. WOODFORD, OF BOSTON, CHAIRMAN.

CHAIRMEN OF THE COMMITTEES ON PLANTS, FLOWERS, FRUITS, VEGETABLES, AND GARDENS, *Ex officiis.*

ROBERT FARQUHAR.

MEMBERS FOR LIFE.

Members of the Society and all other persons who may know of deaths, changes in residence, or other circumstances showing that the following list is incorrect in any particular, will confer a favor by promptly communicating to the Secretary any needed corrections.

Information, or any clew to it, is especially desired in regard to members whose names are marked thus,†

Adams, Mrs. Charles Francis, South Lincoln.
Adams, Henry Saxton, Boston.
Alger, Rev. R. F., Dorchester.
Allen, Hon. Charles H., Lowell.
Allen, Thomas, Boston.
Ames, F. Lothrop, North Easton.
Ames, Mrs. F. L., North Easton.
Ames, George, Boston.
Ames, John S., North Easton.
Ames, Miss Mary S., North Easton.
Ames, Oakes, North Easton.
Ames, Oliver, North Easton.
Ames, Mrs. Oliver, Sr., North Easton.
Ames, Preston Adams, Boston.
Ames, Miss Susan E., North Easton.
Amory, C. W., Boston.
Amory, Frederick, Boston.
Anderson, Larz, Brookline.
Andrews, Charles L., Milton.
Andrews, Frank W., Washington, D. C.
Andros, Milton, San Francisco, Cal.
Appleton, Francis H., Boston.
Appleton, William S., Boston.
Arnold, Mrs. George Francis, Brookline.
Ash, John, Pomfret Centre, Conn.
Asmus, Ernst G., West Hoboken, N. J.
Atkins, Edwin F., Belmont.
Ayer, James B., Boston.

Bailey, Jason S., West Roxbury.
Baker, James E., South Lincoln.
Ball, George H., Boston.
Banfield, Francis L., M.D., Worcester.
Barber, J. Wesley, Newton.
Barnard, James M., Boston.
Barnard, Robert M., Everett.
Barnes, Walter S., Somerville.
† Barney, Levi C., Boston.
Barry, John Marshall, Boston.
Barry, William C., Rochester, N. Y.
Bartlett, Edmund, Newburyport.
Bartlett, Francis, Beverly.
Bartlett, Miss Mary F., Boston.
Bates, Miss Mary D., Ipswich.
Baylies, Walter C., Taunton.
Beal, Leander, Swampscott.
Becker, Frederick C., Cambridge.
Beckford, Daniel R., Jr., Dedham.
Beebe, E. Pierson, Boston.
Beebe, Franklin H., Boston.
Beebe, J. Arthur, Boston.
Bigelow, Albert S., Cohasset.
Bigelow, Joseph S., Cohasset.
Bigelow, Dr. William Sturgis, Boston.
Black, George N., Manchester.

Blake, Miss Anne, Brookline.
Blake, Mrs. Arthur W , Brookline.
Blake, Edward D., Boston.
Blake, Francis, Weston.
Blake, Frederick A., Rochdale.
Blakemore, John E., Roslindale.
Blanchard, John W., West Newton.
Blinn, Richard D., Chicago, Ill.
Bliss, William, Boston.
Boardman, Samuel M., Hyde Park.
Boardman, T. Dennie, Manchester.
Bôcher, Prof. Ferdinand, Cambridge.
Bockus, Charles E., Dorchester.
Bosler, Frank C., Carlisle, Penn.
Bowditch, Charles P., Jamaica Plain.
Bowditch, Ernest W., Milton.
Bowditch, James H., Brookline.
Bowditch, Nathaniel I., Framingham.
Bowditch, William E., Roxbury.
Bowker, William H., Boston.
Brackett, Cephas H., Newton.
Breck, Joseph Francis, Allston.
Bremer, Mrs. John L., Manchester.
Bresee, Albert, Hubbardton, Vt.
Brewer, Francis W., Hingham.
Briggs, William S., Lincoln.
Brigham, William T., Honolulu, Hawaii.
Brooks, Henry, Lincoln.
Brooks, J. Henry, Milton.
Brooks, Lawrence, Groton.
Brooks, Peter C., Boston.
Brooks, Shepherd, Boston.
Brown, Alfred S., Jamaica Plain.
Brown, Edward J., Weston.
Brown, George Barnard, Brookline.
Brown, John M., Belmont.
Brown, Samuel N., Boston.
Burlen, William H., Boston.
Burnett, Harry, Southborough.
Burnham, John A , Manchester.
Burnham, Lamont G., Essex.
Burr, Matthew H., Hingham.
Buswell, Frank E., Brooklyn, N Y.
Butler, Aaron, Wakefield.
Butler, Edward K., Jamaica Plain.
Cabot, Dr. Arthur T., Boston.
†Cadness, John, Flushing, N. Y.
Cains, William, South Boston.
Calder, Augustus P., Boston.
Cameron, Robert, Cambridge.
Campbell, Francis, Cambridge.
Capen, John, Boston.
Carlton, Samuel A., Boston.
Carr, Hon. John, Roxbury.
Carter, Charles N., Boston.
Carter, Miss Maria E., Woburn.
Cartwright, George, Dedham.
Casas, W. B. de las, Malden.
Chadbourne, Marshall W., East Watertown.
Chaffin, John C., Newton.
Chamberlain, Chauncy W., Brookline.
†Chase, Andrew J., Lynn.
Chase, Daniel E., Somerville.
Chase, George B., Dedham.
Chase, William M., Dorchester.
Cheney, Amos P , Natick.
Cheney, Mrs. Elizabeth S., Wellesley.
Childs, Nathaniel R., Boston.
Choate, Charles F., Southborough.
Christie, William, Chelsea.
Claflin, Hon. William, Newtonville.
Clapp, Edward B., Dorchester.
Clapp, James H., Dorchester.
Clapp, William C., Dorchester.
Clark, Benjamin C., Boston.
Clark, B. Preston, Cohasset.
Clark, Miss Eleanor J., Pomfret Centre, Conn.
Clark, J. Warren, Rockville.
Clarke, Miss Cora H., Boston.
Clarke, Eliot C., Boston.
Cleary, Lawrence, Roxbury.
Clough, Micajah Pratt, Lynn.
Cobb, John C., Milton.
Coburn, Isaac E., Everett
Codman, James M., Brookline.
Codman, Ogden, South Lincoln.
Coe, Miss Mary Alma, Boston.

Coffin, Abraham B., Winchester.
Cole, Edward E., Boston.
Collamore, Miss Helen, Boston.
Colton, Samuel H., Worcester.
Converse, Elisha S., Malden.
Converse, Col. H. E., Malden.
Coolidge, Joshua, Mount Auburn.
Coolidge, J. Randolph, Chestnut Hill.
Coolidge, Mrs. J. Randolph, Chestnut Hill.
Coolidge, T. Jefferson, Jr., Boston.
Cottle, Henry C., Boston.
Cox, Thomas A., Dorchester.
Coy, Samuel I., Boston.
Craig, William Nicol, North Easton.
Crane, Zenas, Dalton.
Crawford, Dr. Sarah M., Roxbury.
Crocker, Hon. George G., Boston.
Crocker, Miss S. H., Boston.
Crosby, George E., West Medford.
Cross, Alfred Richard, Nantasket.
Crowell, Randall H., Watertown.
Curtis, Charles F., Jamaica Plain.
Curtis, Charles P., Swampscott.
Curtis, Charles P , Jr., Boston.
Cushing, Livingston, Weston.
Cushing, Robert M., Boston.
Cutting, Gen. Walter, Pittsfield.

† Daggett, Henry C., Boston.
Dalton, Charles H., Beverly.
Daly, John C., Roxbury.
Damon, Frederick W., Arlington.
Dana, Charles B., Wellesley.
Daniels, Dr. Edwin A., Boston.
Davenport, Albert M., East Watertown.
Davenport, George E., Medford.
Davis, Edward L., Worcester.
Davis, John, Lowell.
Davis, L. Shannon, Brookline.
Dawson, Jackson T., Jamaica Plain.
Dee, Thomas W., Cambridge.
Denny, Clarence H., Boston.
Denton, Eben, Dorchester.
Dexter, F. Gordon, Boston.
Dexter, George, Beverly.
Dike, Charles C., Stoneham.
Doliber, Thomas, Brookline.
Donald, William, West Roxbury.
Donaldson, James, Roxbury.
Dorr, George, Dorchester.
Dove, George W. W., Andover.
Dowse, William B. H., West Newton.
Draper, Hon. Eben S., Hopedale.
Draper, George A., Hopedale.
Dreer, William F., Philadelphia, Pa.
Dumaresq, Herbert, Chestnut Hill.
Duncan, James L., Chelsea.
Dunlap, James H., Nashua, N. H.
Durant, William, Boston.
Durfee, George B., Fall River.
Dutcher, Frank J., Hopedale.
Dwight, Theodore F., Kendal Green.

Eaton, Horace, Cambridge.
Edgar, William W., Waverly.
Eldredge, H. Fisher, Boston.
† Eldridge, E. H., Roxbury.
Elliot, Mrs. John W., Boston.
Elliott, William H., Brighton.
Endicott, William, Boston.
Endicott, William, Jr., Boston.
Endicott, William C., Jr., Danvers.
Endicott, William E., Canton.
Estabrook, Arthur F , Boston.
Ewell, Warren, Dorchester.

Fairchild, Charles, Boston.
Falconer, William, Pittsburgh, Pa.
Farlow, Lewis H., Newton.
Farnsworth, Mrs. William, Dedham.
Farquhar, James F. M., Roslindale.
Farquhar, John K. M. L , Roxbury.
Farquhar, Robert, North Cambridge.
Faxon, John, Quincy.
Fay, H. H., Wood's Holl.
Fay, Joseph S., Jr., Wood's Holl.
Fenno, L. Carteret, Boston.
Fessenden, George B., Allston.
Fewkes, Arthur H., Newton Highlands.

Finlayson, Kenneth, Brookline.
Fisher, Peter, Ellis.
Flagg, Augustus, Boston.
Fletcher, George V., Belmont.
Fletcher, J. Henry, Belmont.
Fletcher, John W., Chelsea.
Flint, David B., Boston.
Foster, Charles H. W., Brookline.
Foster, Francis C., Cambridge.
Fottler, John, Jr., Dorchester.
Fowle, George W., Jamaica Plain.
Fowle, William B., Auburndale.
French, Miss Caroline L. W. Boston.
French, S. Waldo, Jamaica Plain.
French, W. Clifford, Cambridge.
Frohock, Roscoe R., Malden.
Frost, Irving B., Belmont.
Frost, Varnum, Arlington.

Galloupe, Charles W., Swampscott.
Galvin, John, Boston.
Gardner, Mrs. Augustus P., Hamilton,
Gardner, George A., Boston.
Gardner, George P., Boston.
Gardner, John L., Boston.
Gardner, Mrs. John L., Brookline.
Gardner, William Amory, Groton.
Gaston, William A., Boston.
Gibbs, Wolcott, M.D., Newport, R.I.
Gill, George B., Medford.
Gillard, William, Dorchester.
Gilmore, E. W., North Easton.
Gilson, F. Howard, Wellesley Hills.
Glover, Joseph B., Boston.
Goddard, Joseph, Sharon.
Goodell, L. W., Dwight.
Gorham, James L., Jamaica Plain.
† Gould, Samuel, Boston.
Gowing, Mrs. Clara E., Kendal Green.
Gray, James, Wellesley.
Gray, Mrs. John C., Boston.
Gregory, Hon. James J. H., Marblehead.
Grew, Edward S., Boston.
Grey, Benjamin, Malden.

Hadwen, Obadiah B., Worcester.
Hale, James O., Byfield.
Hall, Edwin A., Cambridgeport.
Hall, George A., Chelsea.
Hall, Jackson E., Boston.
Hall, Osborn B., Malden.
Hall, William F., Brookline.
Halliday, William H., South Boston.
Hammond, Gardiner G, New London, Conn.
Hammond, George W., Boston.
† Harding, George W., Arlington.
Harding, Louis B., Chestnut Hill.
Hardy, F. D., Cambridgeport.
Harlow, James F., Quincy.
Harris, Charles, Cambridge.
Harris, Thaddeus William, A.M., Keene, N. H.
Hartshorn, Arthur E., Worcester.
Harwood, George Fred, Newton.
Haskell, Edwin B., Auburndale.
Hastings, Levi W., Brookline.
Hatch, Mrs. C. S., North Cambridge.
Hatch, Edward, Boston.
Haven, Franklin, Boston.
Hawken, Mrs. Thomas, Rockland, Me.
Hayward, George P., Roxbury.
† Hazeltine, Hazen, Boston.
Hemenway, Augustus, Canton.
Hemenway, Mrs. Augustus, Canton.
Henshaw, Joseph P. B., Boston.
Henshaw, Samuel, Cambridge.
Heurlin, Julius, South Braintree.
Hewett, Miss Mary C., Canton.
Hews, Albert H., North Cambridge.
Higginson, Francis L., Boston.
Hilbourn, A. J., Boston.
Hill, John, Stoneham.
Hittinger, Jacob, Mt. Auburn.
Hoar, Samuel, Concord.
Hodgkins, John E., Portsmouth, N.H.

Hoitt, Hon. Charles W., Nashua, N. H.
Hollingsworth, Amor L., Milton.
Hollingsworth, Z. T., Boston.
Hollis, George W., Grantville.
Holmes, Edward J., Boston.
Holt, Gustavus C., Belmont.
Holt, Mrs. Stephen A., Cambridge.
Holt, William W., Winchester.
Hooper, William, Boston.
Horner, Mrs. Charlotte N.S., Georgetown.
Horsford, Miss Kate, Cambridge.
Hovey, Charles H., South Pasadena, Cal.
Hovey, Stillman S., Woburn.
Howard, Joseph W., Somerville.
Hubbard, Charles Wells, Weston.
Hubbard, James C., Everett.
Humphrey, George W., Dedham.
Hunnewell, Arthur, Wellesley.
Hunnewell, Henry Sargent, Wellesley.
Hunnewell, H. Hollis, Wellesley.
Hunnewell, Walter, Wellesley.
Hunt, Dudley F., Reading.
Hunt, Francis W., Melrose.
Hunt, Franklin, Charlestown, N. H.
Hunt, William H , Concord.

Jack, John George, Jamaica Plain.
Jackson, Charles L., Cambridge.
Jackson, Robert T., Boston.
James, George Abbot, Nahant.
Janvrin, William S., Revere.
Jeffries, William A., Boston.
Jenks, Charles W., Bedford.
Johnson, J. Frank, Malden.
Jones, Jerome, Brookline.
Jones, Dr. Mary E., Boston.
Jordan, Eben D., Boston.
Jordan, Henry G., Hingham.
Jose, Edwin H., Cambridgeport.

Kakas, Edward, West Medford.
Kellen, William V., Marion.
Kelley, George B., Jamaica Plain.
Kendall, D. S., Woodstock, Ont.
Kendall, Edward, Cambridgeport.
† Kendall, Joseph R., San Francisco, Cal.
Kendall, Dr. Walter G., Atlantic.
Kendrick, Mrs. H. P., Allston.
Kennedy, George G., M. D., Roxbury.
Kent, John, Chestnut Hill.
Keyes, John M., Concord.
Kidder, Charles A., Southborough.
Kidder, Nathaniel T., Milton.
† Kimball, A. P., Boston.
Kimball, David P., Boston.
King, D. Webster, Boston.
Kingman, Abner A., Brookline.
Kingman, C. D., Middleborough.
Kinney, H. R., Worcester.
Knapp, Walter H., Newtonville.

Lamb, Horatio A., Milton.
Lancaster, Charles B., Boston.
Lanier, Charles, Lenox.
Lawrence, Amory A., Boston.
Lawrence, Amos A., Boston.
Lawrence, James, Groton.
Lawrence, John, Groton.
Lawrence, Rt. Rev. William, Boston.
Learned, Charles A., Arlington.
Lee, Daniel D., Jamaica Plain.
Lee, Francis H., Salem.
Lee, George C., Newton.
Leeson, Hon. Joseph R., Newton Centre.
Lemme, Frederick, Charlestown.
Leuchars, Robert B., Dorchester.
Lincoln, George, Hingham.
Lincoln, Col. Solomon, Boston.
Little, James L., Brookline.
Little, John Mason, Swampscott.
Locke, Edwin F., West Medford.
Locke, Isaac H., Belmont.
Lockwood, Rhodes, Boston.
Lodge, Richard W., Boston.

Loftus, John P., Dorchester.
Loomis, Elihu G., Bedford.
Loring, Augustus P., Beverly.
Loring, Mrs. William Caleb, Beverly.
Lothrop, William S. H , Boston.
† Lowder, John, Watertown.
Lowell, Abbott Lawrence, Boston.
Luke, Otis H., Brookline.
Lumb, William, Boston.
Lunt, William W., Hingham.
Lyman, George H., Wareham.
Lyman, Mrs. Theodore, Brookline.

Mabbett, George, Plymouth.
Mackie, George, M. D., Attleboro.
† Mahoney, John, Boston.
Mallett, E. B., Jr., Freeport, Me.
Mann, James F., Ipswich.
Manning, Jacob W., Reading.
Manning, J. Woodward, Reading.
Manning, Mrs. Lydia B., Reading.
Manning, Robert, Salem.
Manning, Warren H., Brookline.
Marshall, Frederick F., Everett.
Marston, Howard, Boston.
Mason, Miss Ellen F., Boston.
Mason, Col. Frederick, Taunton.
Matthews, Nathan, Boston.
May, Frederick W. G., Boston.
McCarty, Timothy, Providence, R. I.
McWilliam, George, Whitinsville.
Melvin, James C., West Newton.
Merriam, Charles, Boston.
Merriam, Herbert, Weston.
Merrill, Hon. Moody, Roxbury.
Metivier, James, Cambridge.
Milmore, Mrs. Joseph, Washington, D. C.
Minot, Charles S., Milton.
Minton, James, Boston.
Mitton, Edward J., Brookline.
Mixter, George, Boston.
Monteith, David, Dedham.
Montgomery, Alexander, Natick.
Moore, George D., Arlington.
Moore, John H., Concord.
Morgan, George H., New York, N. Y.
Morse, John T., Jr., Boston.
Morse, Robert M., Jamaica Plain.
Moseley, Charles H., Dorchester.
Mudge, George A., Portsmouth, N. H.
Murdock, Albert L., Boston.
Murphy, William Bowen, Boston.
Murray, Peter, Fairhaven.
Mutch, John, Brookline.

Nevins, Mrs. David, Methuen.
Newman, John R., Winchester.
Newton, Rev. William W., Pittsfield.
Nickerson, Mrs. George A., Dedham.
Norton, Charles W., Allston.
Norton, Edward E., Boston.

Oakman, Hiram A., North Marshfield.
Olmsted, Frederick Law, Jr., Brookline.
Olmsted, John C., Brookline.
Orpet, Edward O., South Lancaster.

Page, Mrs. Henrietta, Boston.
Paige, Clifton H., Mattapan.
Parker, Charles W., Boston.
Parkman, Henry, Boston.
Parsons, John E., Lenox.
Partridge, Horace, North Cambridge.
Patten, Marcellus A., Tewksbury.
Paul, Alfred W., Dighton.
Peabody, Francis H., Boston.
Peabody, George A., Danvers.
Peabody, John E., Salem.
Peabody, S. Endicott, Salem.
Peck, O. H., Denver, Col.
Peck, William G , Arlington.
Peirce, Miss Marion W., Topsfield.
† Perry, George W., Malden.
Pfaff, Col. Charles, South Framingham.
Philbrick, William D., Newton Centre.
Phillips, John C., North Beverly.
Phillips, Mrs. John C., North Beverly.

Phillips, William, North Beverly.
Pierce, Dean, Brookline.
Pierce, Elisha N., Waltham.
Pierce, George Francis, Neponset.
Pond, Preston, Winchester.
Poor, John R., Brookline.
Pope, Col. Albert A., Cohasset.
Porter, Alexander S., Boston.
Porter, James C., Wollaston.
Porter, Hon. Joseph S., Washington, D. C.
Prang, Louis, Boston.
Pratt, Laban, Dorchester.
Pratt, Lucius G., West Newton.
Pratt, Robert M., Boston.
Prendergast, J. M., Boston.
Prescott, Eben C., New York, N. Y.
Pringle, Cyrus G., Charlotte, Vt.
Proctor, T. E., Boston.
Prouty, Gardner, Littleton.
Putnam, George, Manchester.
Putnam, George J., Brookline.
Putnam, Joshua H., Newton Centre.

Quinby, Hosea M., M.D., Worcester.

Raddin, Everett W., North Cambridge.
Rand, Harry S., North Cambridge.
Rand, Oliver J., Cambridgeport.
Rawson, Warren W., Arlington.
Ray, James F., Franklin.
Raymond, Walter, Boston.
Read, Charles A., Manchester.
Reardon, John B., Boston.
Reed, Henry R., Jamaica Plain.
Rice, George C., Worcester.
Richards, John J., Boston.
Richardson, Charles E., Brookline.
Richardson, Dr. William L., Boston.
Rinn, J. Ph., Boston.
Ripley, Charles, Dorchester.
Ripley, Ebed L., Hingham Centre.
Robbins, I. Gilbert, Melrose Highlands.
Robinson, John, Salem.
Robinson Joseph B , Dorchester.
Robinson, Warren J., Somerville.
Rogers, Mrs. Jacob C., Peabody.
Roland, Thomas, Nahant.
Rothwell, James E., Brookline.
Roy, David Frank, Malden.
Ruddick, William H., M.D., South Boston.
Russell, George, Woburn.
Russell, James S., Milton.
Russell, Hon. John E., Leicester.
Russell, Walter, Arlington.

Salisbury, William C. G., Brookline.
Saltonstall, Richard M., Newton.
Sanford, Oliver S., Hyde Park.
Sanger, Mrs. George P., Boston.
Sargent, Andrew Robeson, Brookline.
Sargent, Charles S., Brookline.
Sargent, Mrs. Charles S., Brookline.
Sargent, Mrs. Francis W., Wellesley.
Sawtelle, Eli A., Boston.
Sawyer, Timothy T., Boston.
Scorgie, James C , Cambridge.
†Scott, Charles, Newton.
Sears, Miss Clara E., Boston.
Sears, Miss Emily E., Boston.
Sears, Dr. Henry F., Boston.
Sears, J. Montgomery, Boston.
Sears, Mrs. J. Montgomery, Boston.
Shaler, Nathaniel S., Cambridge.
Sharp, Miss Helen, Boston.
Shaw, Christopher C., Milford, N. H.
Shaw, Francis, Wayland.
Shaw, Mrs. Robert G., Wellesley.
Sherman, William H., Boston.
Shorey, John L., Lynn.
Shuman, Hon. A., Roxbury.
Shurtleff, Josiah B., Jr., Revere.
Sias, Charles D., Wenham.
Siebrecht, H. A., New Rochelle, N.Y.
Simpkins, Miss Mabel, Yarmouth.
Skinner, Francis, Boston.
Skinner, Francis, Jr., Boston.

Sleeper, Henry Davis, Boston.
Smith, Archibald, West Somerville.
Smith, Calvin W., Wellesley Hills.
Smith, Charles H., Newton Highlands.
Smith, Charles S., Lincoln.
Smith, Edward N., San Francisco, Cal.
Smith, George O., East Lexington.
Smith, Thomas Page, Waltham.
Snow, Eugene A., Melrose.
Sohier, Col. William D., Beverly.
Souther, Charles H., Jamaica Plain.
Spaulding, Edward, West Newton.
Speare, Alden, Newton Centre.
Spooner, William H., Jamaica Plain.
Sprague, Hon. Charles F., Brookline.
Sprague, Isaac, Wellesley Hills.
Springall, George, Malden.
Stearns, Charles H., Brookline.
Stearns, Frank W., Newton.
Stedman, Henry R., M. D., Roslindale.
Stevens, Hon. Moses T., Andover.
Stewart, William J., Winchester.
Stone, Charles A., Newton.
Stone, Charles W., Boston.
Stone, Prof. George E., Amherst.
Stone, George F., Chestnut Hill.
Strater, Herman, Roxbury.
Strong, William C., Waban.
Swain, Charles E., Roxbury.
Sweet, Everell F., Malden.

Talbot, Mrs. I. Tisdale, Boston.
Taylor, Charles H., Boston.
Taylor, Horace B., Portland, Me.
Temple, Felker L., Boston.
Tenney, C. H., Methuen.
Thatcher, William, Brookline.
Thayer, Mrs. Alice R., Boston.
Thayer, Bayard, Lancaster.
Thayer, Mrs. Bayard, Lancaster.
Thayer, Eugene V. R., South Lancaster.
Thayer, Mrs. Eugene V. R., South Lancaster.
Thayer, John E., South Lancaster.
Thayer, Mrs. John E., South Lancaster.
Thayer, Nathaniel, Lancaster.
Thayer, Mrs. Nathaniel, Lancaster.
Thayer, S. V. R., Boston.
Thiemann, Hermann, Manchester.
Thomas, W. B., Manchester.
Thurlow, Thomas C., West Newbury.
Tilton, Stephen W., Roxbury.
Todd, John, Hingham.
Tolman, Benjamin, Concord.
Tolman, Miss Harriet S., Boston.
Toppan, Roland W., Malden.
Torrey, Everett, Charlestown.
Tower, Miss Ellen May, Lexington.
Tower, Mrs. Helen M., Cambridge.
Tower, Sylvester, Boston.
Travis, Charles B., Brighton.
Trepess, Samuel J., Glencove, L. I., N. Y.
Tucker, Lawrence, Boston.
† Turner, John M., Dorchester.

Underwood, Loring, Belmont.

Vander-Woerd, Charles, Waltham.
Vaughan, William Warren, Boston.
Vinal, Miss Mary L., Somerville.

Wakefield, E. H., Cambridge.
Walcott, Henry P., M.D., Cambridge.
Waldo, C. Sidney, Jamaica Plain.
Wales, George O., Braintree.
Walker, Miss Mary Sophia, Waltham.
Walley, Mrs. W. P., Boston.
Walsh, Michael H., Wood's Holl.
Waltham, George C., Dorchester.
Walton, Daniel G., Wakefield.
Ward, Francis Jackson, Roxbury.
Ward, John, Newton Centre.
Ware, Benjamin P., Clifton

Ware, Miss Mary L., Boston.
Warren, Samuel D., Dedham.
Washburn, Andrew, Hyde Hark.
Watson, Benjamin M., Jamaica Plain.
Watson, Thomas A., East Braintree.
Watts, Isaac, Waverly.
Webber, Aaron D., Boston.
Webster, Hollis, Cambridge.
Welch, David, Dorchester.
Weld, Christopher Minot, Jamaica Plain.
Weld, George W., Boston.
Weld, Richard H., Boston.
Weld, Gen. Stephen M., Dedham.
West, Mrs. Maria L.. Neponset.
Weston, Seth, Chelsea.
Wheeler, Frank, Concord.
Wheeler, James, Brookline.
Wheeler, Wilfred, Concord.
Wheelwright, A. C., Brookline.
Wheelwright, Edmund M., Boston.
Whitcomb, William B., Medford.
White, Mrs. Charles T., Boston.
White, Francis A , Brookline.
White, George R., Boston.
White, Joseph H., Brookline.
Whitney, Arthur E., Winchester.
Whitney, Ellerton P., Milton.
Whitney, Henry M., Cohasset.
Whittier, George E., Groton.
Whittier, William Benjamin, South Framingham.
Wigglesworth, George, Milton.
Wilbur, George B , West Newton.
Wilder, Edward Baker, Dorchester.
Wilder, Henry A., Malden.
Willard, E. W., Newport, R. I.
Willcutt, Levi L., Brookline.
Williams, Miss Adelia Coffin, Roxbury.
Williams, Benjamin B., Boston.
Williams, Henry Bigelow, Boston.
Williams, John Davis, Boston.
Williams, Philander, Taunton.
Willis, George W., Chelsea.
Willis, Joshua C., Roxbury.
Wilson, Col. Henry W., Boston.
Wilson, William Power, Boston.
Winthrop, Robert C., Jr., Boston.
Wood, William K., West Newton.
Woods, Henry, Boston.
Wright, George C., West Acton.
Wright, John G., Brookline.
Wyman, Oliver B., Shrewsbury.
Wyman, Windsor H., North Abington.

ANNUAL MEMBERS.

Members of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly communicating to the Secretary the needed corrections.

Allen, Charles L., Floral Park, N.Y.
Alles, William H., Chestnut Hill.
Anderson, George M., Milton.
Arnold, Miss Sarah L., Newton Centre.
Atkinson, Edward, Brookline.
Ayres, Miss Helen F., Medford.

Barker, John G., Melrose.
Barr, John, Wellesley.
Bigelow, Arthur J., Eastlake, Worcester.
Bigelow, Mrs. Nancy J., Southborough.
Bird, John L., Dorchester.
Blomberg, Carl, North Easton.
Bock, William A., North Cambridge.
Bolles, William P., M.D., Roxbury.
Boyden, Clarence F., Taunton.
Bradley, Miss Abby A., Hingham.
Braman, George H., Newton.
Breck, Charles H., Newton.
Brunton, Frank, Stockbridge.
Butler, Edward, Wellesley.

Carpenter, Frank O., West Roxbury.
Carter, Mrs. Sarah D. J., Wilmington.
Cary, Miss Alice B., Lexington.
Chase, Joseph S., Malden.
Chase, Philip A., Lynn.
Chubbuck, Isaac Y., Roxbury.
Clapp, Henry L., Roxbury.
Clark, John W., North Hadley.
Clark, Joseph, Manchester.
Clark, Theodore M., Newtonville.
Clinkaberry, Henry T., Trenton, N. J.
Collins, Frank S., Malden.
Comley, James, Lexington.
Coolidge, Dr. Sumner, East Watertown.
Cotter, Lawrence, Dorchester.
Cotting, Charles U., Boston.
Crosby, J. Allen, Jamaica Plain.
Curtis, Joseph H., Boston.
Curtis, Louville, Tyngsborough.

Davis, Frederick S., West Roxbury.
Dawson, Charles Jackson, Newark, N. J.
Derby, William H., Revere.
Dolbear, Mrs. Alice J., College Hill.
Dorr, George B., Boston.
Doyle, William E., East Cambridge.
Duffley, Daniel, Brookline.

Eastman, Edmund C., Brookline.
Eaton, Warren E., Reading.
Endicott, Miss Charlotte M , Canton.
Eustis, William Tracy, Brookline.
Ewell, Marshall F., Marshfield Hills.

Fenno, Warren, Revere.
Fisher, Sewell, Framingham.
Fiske, Harry E., Wollaston.

Fitzgerald, Desmond, Brookline.
Fletcher, Fred W., Auburndale.
Forbes, William H., Jamaica Plain.
Francis, George E., M.D., Worcester.
Fuller, T. Otis, Needham.

Gill, Mrs. E. M., Medford.
Gilman, Hon. Virgil C., Nashua, N. H.
Grant, Charles E., Concord.
Grew, Henry Sturgis, Boston.
Grey, Robert Melrose, North Easton.
Grey, Thomas J., Chelsea.

Hall, Charles H., M.D., Corning, Cal.
Hall, Stacy, Boston.
Hallstram, Charles W., Boston.
Ham, Fernald E., Burlington.
Hargraves, William J., Jamaica Plain.
Harris, Frederick L., Wellesley.
Harrison, C. S., York, Nebraska.
Harrison, Thomas, Melrose Highlands.
Hartwell, Samuel, Lincoln.
Hatfield, T. D., Wellesley.
Hersey, Edmund, Hingham.
Heustis, Warren H., Belmont.
Hill, J. Willard, Belmont.
Hinds, Warren D., Townsend.
Hobbs, George M., Boston.
Hollis, George, South Weymouth.
Houghton, George S., West Newton.
Howden, Thomas, Whitinsville.
Hubbard, F. Tracey, Cambridge.
Huston, Miss Katharine W., Jamaica Plain.

Illenberger, Henry, Brookline.
Ireland, Robert D., Winthrop.

James, Robert Kent, Dorchester.
Jameson, G. W., East Lexington.

Keith, Mrs. Mary R., Washington, D. C.
Kelsey, Harlan P., Boston.
Kemp, William S., Brookline.
Kennard, Frederic H., Brookline.

Lancaster, Mrs. E. M., Roxbury.
Laurie, Robert, Newport, R. I.
Lawson, Joshua, Brookline.
Lincoln, Miss Agnes W., Medford.
Lomax, George H., Somerville.
Loring, Charles G., Boston.
Loring, Mrs. Thacher, Brookline.
Loring, William C., Beverly.
Lothrop, Thornton K., Boston.
Low, Hon. Aaron, Hingham.

Manda, W. A., South Orange, N. J.
Manning, A. Chandler, Reading.
Martin, William J, Milton.
Maynard, Charles, North Easton.
McLaren, Anthony, Westwood.
Meriam, Horatio C., D.M.D., Salem.
Metcalf, Dr. Ben H., Winthrop.
Milman, William, Roxbury.
Moody, Abner J., Boston.
Morgan, George M., Boston.
Morrison, William, Cohasset.
Moseley, Frederick C., Dorchester.
Moseley, Frederick Strong, Newburyport.
Munson, Prof. W. M., Orono, Me.

Newton, John F., Roxbury.
Nicholson, William, Framingham.
Norton, Michael H., Boston.
Norton, Patrick, Dorchester.

Olmsted, Frederick Law, Brookline.

Park, William D., Boston.
Parker, John, Newtonville.
Parker, Walter S., Reading.
Patterson, William, Quincy.
Peirce, George H., Concord Junction.

Petremant, Robert, Brooklyn, N. Y.
Pettigrew, John A., Jamaica Plain.
Pickman, Dudley L., Boston.
Pierce, Mrs. F. A., Brookline.
Plimpton, Willard P., West Newton.
Pray, James Sturgis, Cambridge.
Purdie, George A., Ormond, Florida.

Rea, Charles H., Norwood.
Rea, Frederic J., Norwood.
Rich, Miss Ruth G., Dorchester.
Rich, William E. C., Roxbury.
Rich, William P., Chelsea.
Richards, Mrs. P. D., West Medford.
Robb, Peter B., Whitinsville.
Robbins, Oliver R., Weston.
Robinson, Walter A., Arlington.
Rodman, Miss Mary, Concord.
Ross, Charles W., Newtonville.
Ross, Henry Wilson, Newtonville.

Sander, Charles, Brookline.
Saunders, Miss Mary T., Salem.
Scott, Augustus E., Lexington.
Scudder, Samuel H., Cambridge.
Searles, E. F., Methuen.
Seaver, Edwin P., Waban.
Sharples, Stephen P., Cambridge.
Shaw, Hon. Edward P., Newburyport.
Shea, James B., Jamaica Plain.
Shepard Harvey N., Boston.
Sheppard, Edwin, Lowell.
Southworth, Edward, Quincy.
Squire, Miss Esther A., North Cambridge.
Stevens, Mrs. Mary L., Cambridge.
Stone, Joshua C., Watertown.
Story, Miss Sarah W., Brighton.
Strange, David T., Stoneham.
Sullivan, Michael, Revere.
Sutherland, George A., Roslindale.
Swan, Charles W., M.D., Brookline.

Tailby, Joseph, Wellesley.
Teele, William H., West Acton.
Tobey, Rufus T., Roxbury.
Tyler, Mrs. John F., North Andover.
Tyndale, Theodore H., Brookline.

Vaughan, J. C., Chicago, Ill.

Warren, Samuel H., Weston.
Welch, Patrick, Dorchester.
Westwood, Thomas H., Jamaica Plain.
Wheeler, Henry A., Newtonville.
White, Maurice P., Roxbury.
White, W. Henry, Lowell.
Whitney, Joseph, Cambridgeport.
Whiton, Hon. Starkes, Hingham Centre.
Wilder, Miss Grace S., Dorchester.
Wilder, Miss Jemima R., Dorchester.
Wilkie, Edward A., Newtonville.
Winter, William C., Mansfield.
Wolcott, Mrs. H. L. T., Dedham.
Wood, Mrs. Anna D , West Newton.
Wood, Elijah A., West Newton.
Wood, E. W., West Newton.
Woodford, Joseph H., Boston.
Woods, Henry F., Boston.

Young, E. Bentley, Boston.

Zirngiebel, Denys, Needham.

EXTRACTS FROM THE CONSTITUTION AND BY-LAWS.

SECTION XXII.

Life Members.

The payment of thirty dollars shall constitute a Life Membership, and exempt the member from all future assessments, and any Annual Member, having paid all dues, may become a Life Member by the payment of twenty dollars in addition thereto.

Annual Membership.

Every Annual Member, before he receives his diploma, or exercises the privileges of a member, shall pay the sum of ten dollars as an admission fee, and shall be subject afterwards to an annual assessment of two dollars.

SECTION XXIII.

Withdrawal or Discontinuance of Membership.

Any member may withdraw from the Society, on giving notice to the Treasurer and paying the amount due from him. Any member who shall neglect for the space of two years to pay his annual assessment, after due notice from the Treasurer, shall cease to be a member. The Treasurer shall give notice of such withdrawals, or discontinuances to the Secretary, who shall erase such members' names from the list.

The attention of Annual Members is particularly called to Section XXIII.

HONORARY MEMBERS.

Members and correspondents of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly communicating to the Secretary the needed corrections.

Information, or any clew to it, is especially desired in regard to Joseph Maxwell, *elected in* 1830, *and* George W. Smith, *elected in* 1851.

Hon. George S. Boutwell, Groton.

Clarence H. Clark, Ex-President of the Pennsylvania Horticultural Society, Philadelphia.

Joseph Jefferson, Buzzard's Bay.

Major L. A. Huguet-Latour, M. P., Montreal, Canada.

Sir Trevor Lawrence, President of the Royal Horticultural Society, London.

Joseph Maxwell, Rio Janeiro, Brazil.

Donald G. Mitchell, New Haven, Conn.

Hon. J. Sterling Morton, Ex-Secretary of Agriculture, Nebraska City, Neb.

Baron R. Von Osten Sacken, Heidelberg, Germany.

Samuel B. Parsons, Flushing, N. Y.

Dr. Henry S. Pritchett, President of the Massachusetts Institute of Technology, Boston.

George W. Smith, Boston.

Albert Viger, President of the National Society of Horticulture of France, Paris.

Hon. James Wilson, Secretary of Agriculture, Washington, D. C.

CORRESPONDING MEMBERS.

Members and correspondents of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly reporting to the Secretary the needed corrections.

Information, or any clew to it, is especially desired in regard to Alexander Burton, *elected in* 1829; S. Reynolds, M.D., 1832; *and* Francis Summerest (or Summerer), 1833.

ÉDOUARD ANDRÉ, Editor-in-chief of the Revue Horticole, Paris, France.

GEORGE FRANCIS ATKINSON, Professor of Botany in Cornell University, Ithaca, N. Y.

PROFESSOR L. H. BAILEY, Horticultural Department, Cornell University, Ithaca, N. Y.

JOHN GILBERT BAKER, F. R. S., F. L. S., Kew, England.

CHARLES BALTET, Président de la Société Horticole, Vigneronne, et Forestière de l' Aube, Troyes, France.

PETER BARR, London, England.

ARCHIBALD F. BARRON, Turnham Green, London, W.

NAPOLEON BAUMANN, Bolwiller, Alsace.

D. W. BEADLE, 303 Crawford St., Toronto, Ontario.

PROFESSOR WILLIAM J. BEAL, Agricultural College, Michigan.

PROSPER J. BERCKMANS, Ex-President of the American Pomological Society, Augusta, Ga.

CHARLES E. BESSEY, Ph. D., Professor of Botany in the Industrial College of the University of Nebraska, Lincoln.

DR. CH. BOLLE, Berlin, Prussia.

COL. GUSTAVUS B. BRACKETT, Pomologist to the United States Department of Agriculture, Washington, D. C.

JOHN CROUMBIE BROWN, LL.D., Haddington, Scotland.

PROFESSOR J. L. BUDD, Ames, Iowa.

WILLIAM BULL, Chelsea, England.

F. W. BURBIDGE, M.A., Trinity College Botanic Garden, Dublin, Ireland.

ALEXANDER BURTON, United States Consul at Cadiz, Spain, Philadelphia

DANIEL T. CURTIS, Dorchester.

REV. H. HONYWOOD D'OMBRAIN, Westwell Vicarage, Ashford, Kent, England.

SIR W. T. THISELTON DYER, K. C. M. G., F. R. S., Director of the Royal Botanic Gardens, Kew, England.

PARKER EARLE, President of the American Horticultural Society, Roswell, N. M.

GEORGE ELLWANGER, Rochester, N. Y.

HENRY JOHN ELWES, F. L. S., F. Z. S., Colesborn, Andoversford, Gloucestershire, England.

WILLIAM G. FARLOW, M.D., Professor of Cryptogamic Botany, Harvard University.

B. E. FERNOW, Forestry School, Cornell University, Ithaca, N. Y.

HON. ROBERT W. FURNAS, Ex-President of the Nebraska State Horticultural Society, Brownville.

BEVERLY T. GALLOWAY, Horticulturist and Superintendent of Gardens and Grounds of the United States Department of Agriculture, Washington, D.C.

CHARLES A. GOESSMANN, Ph.D., LL.D., Chemist of the Hatch Experiment Station of the Massachusetts Agricultural College, Amherst.

GEORGE L. GOODALE, M.D., Professor of Botany, Harvard University, Cambridge.

HENRY H. GOODELL, President of the Massachusetts Agricultural College, Amherst.

OBADIAH B. HADWEN, President of the Worcester County Horticultural Society, Worcester.

PROFESSOR BYRON D. HALSTED, Botanist and Horticulturist at the New Jersey Agricultural Experiment Station, New Brunswick, N. J.

PROFESSOR CARL HANSEN, of the Royal College of Agriculture, Copenhagen, Denmark.

J. H. HART, Superintendent of the Botanic Garden, Trinidad.

DR. F. M. HEXAMER, Editor of the American Agriculturist, New York.

J. W. HOFFMANN, Colored State University, Orangeburg, S. C.

J. C. HOLDING, Ex-Treasurer and Secretary of the Cape of Good Hope Agricultural Society, Cape Town, Africa.

THE VERY REV. S. REYNOLDS HOLE, D.D., Dean of Rochester, Rochester, England.

SIR JOSEPH HOOKER, K.C.S.I., The Camp, Sunningdale, England.

JOSIAH HOOPES, West Chester, Pa.

GEORGE HUSMANN, Napa, Cal.

CHARLES JOLY, Honorary Vice-President of the Société Nationale d'Horticulture de France, Paris.

SIR GEORGE KING, K. C. I. E., M. B., LL. D., F. R. S., Calcutta.

PROFESSOR WILLIAM R. LAZENBY, Department of Horticulture and Forestry; Secretary College of Agriculture and Domestic Science, Ohio State University, Columbus, O.

MAX LEICHTLIN, Baden-Baden, Germany.

VICTOR LEMOINE, Nancy, France.

DR. PETER MACOWAN, Director of the Botanic Garden, Cape Town, Africa.

DR. MAXWELL T. MASTERS, Editor of the Gardeners' Chronicle, London.

GEORGE MAW, Benthal, Kinley, Surrey, England.

T. C. MAXWELL, Geneva, N. Y.

F. W. Moore, A. L. S., Curator of the Royal Botanic Gardens, Glasnevin, Dublin, Ireland.

Dr. Daniel Morris, C.M.G., D.Sc., M.A., F.L.S , Imperial Department of Agriculture, Barbados.

George Nicholson, Kew, England.

Peter Nøvik, Secretary of the Norwegian Horticultural Society, Christiania.

William Paul, Waltham Cross, London, N.

Professor D. P. Penhallow, Director of the Botanic Garden, Montreal, Canada.

Henry Probasco, Cincinnati, Ohio.

P. T. Quinn, Newark, N. J.

Cavalière Enrico Ragusa, Palermo, Sicily.

D. Redmond, St. Nicholas, Florida.

S. Reynolds, M.D., Schenectady, N. Y.

Benjamin Lincoln Robinson, Ph.D., Curator of the Gray Herbarium of Harvard University, Cambridge.

William Robinson, Editor of Gardening Illustrated, London.

William Salway, Superintendent of Spring Grove Cemetery, Cincinnati, O.

Edgar Sanders, Chicago, Ill.

William R. Smith, Superintendent of the Botanic Garden, Washington, D. C.

Robert W. Starr, Port William, N. S.

Dr. Joseph Stayman, Leavenworth, Kan.

Francis Summerest.

William Trelease, Director of the Missouri Botanic Garden, St. Louis.

Dr. Melchior Treub, Director of the Botanic Garden, Buitenzorg, Java.

H. J. Veitch, Chelsea, England.

William Watson, Curator of Royal Gardens, Kew, England.

Professor L. Wittmack, Secretary of the Royal Prussian Horticultural Society, Berlin, Prussia.

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